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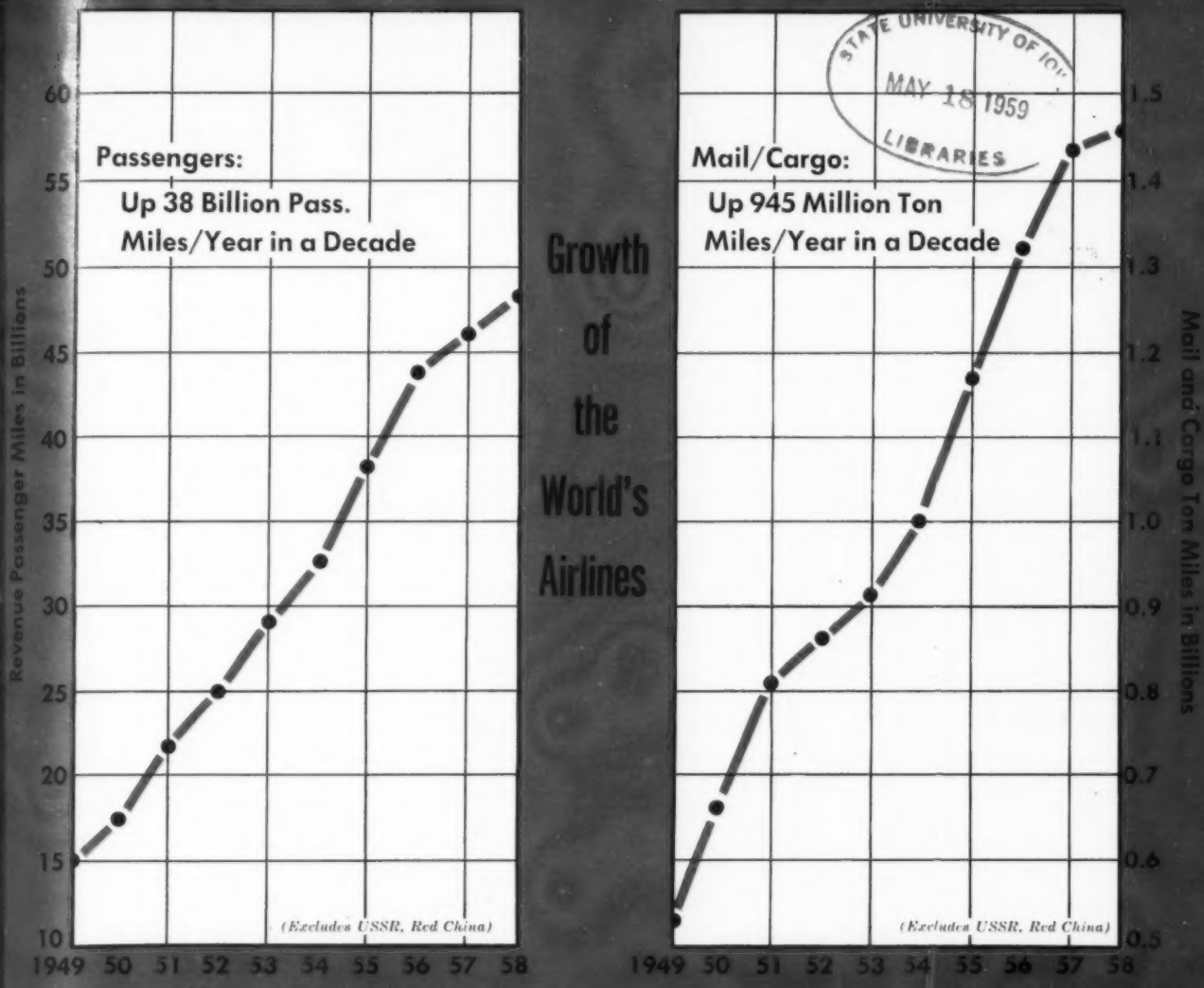

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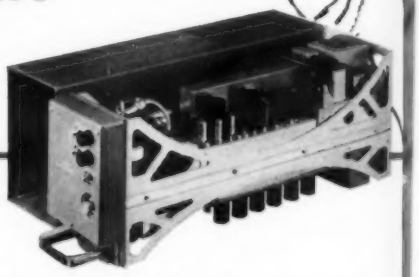

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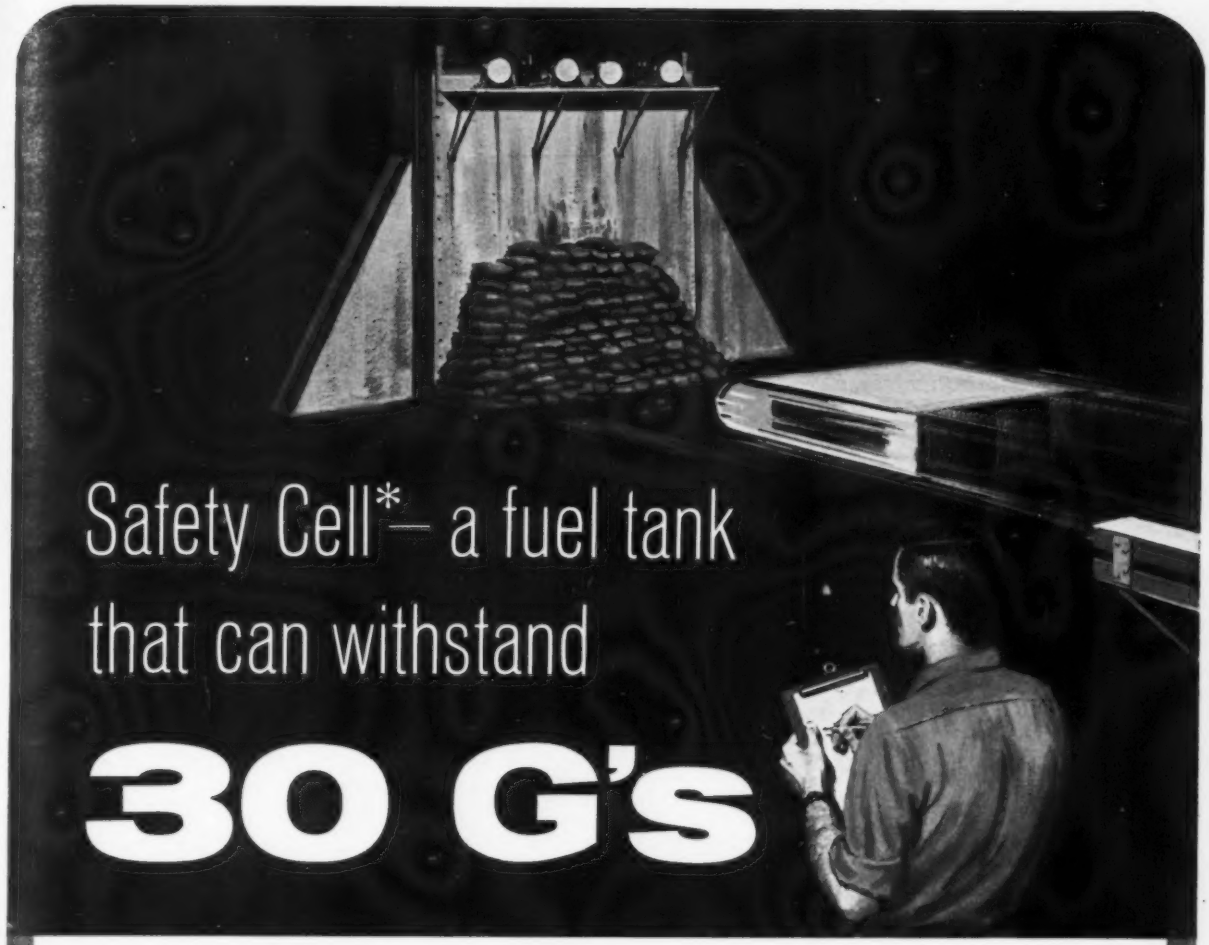

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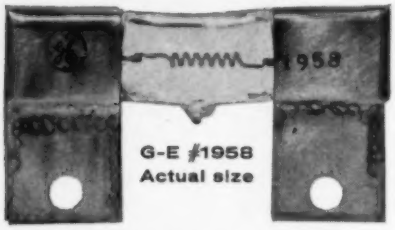

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MAY, 1959—VOL. 22, NO. 24

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WORLD AIR TRANSPORTATION

TENTH ANNUAL AIR TRANSPORT PROGRESS ISSUE

Including 20th edition, ATA Facts & Figures

USSR PLANS THE FUTURE
In this exclusive story, N. V. Ochnev, deputy chief of Russia's Central Aviation Administration, pulls back the curtain for a look at Red civil aviation. Page 41.

JETS AND ECONOMICS
Per Norlin, an executive with SAS and well known industrialist, draws on his wealth of experience in reviewing some of the problems today's airlines face. Page 43.

NO RECESSION FOR FRENCH CARRIERS
The world-wide recession was a heavy blow to many airlines, but the French carriers bucked the tide and reported that they had a better-than-expected year. Page 46.

MAINTENANCE BY X-RAY
An AIRLIFT survey of how the airlines are licking maintenance problems with X-ray reveals that the users are high in praise, but they want a lighter machine. Page 157.

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AIR TRANSPORT FACTS & FIGURES

20th Edition, published by Air Transport Assn. 103-135

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Coming Next Issue: AIRLIFT introduces the first in a series of articles by the labor leaders in air transport. As first guest author, Rowland K. Quinn, Jr., president of Air Line Stewards and Stewardesses Association, discusses the jurisdictional problems plaguing labor organization which now represent employes in the airline industry.

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Circle No. 38 on Reader Service Card.

Is The King Still On His Throne?

The bright lads who draw up the advertising copy for the airlines have always striven to place the customer on some sort of royal throne. Many are the variations but in essence any common, ordinary citizen can become His Royal Highness the Passenger if he will but lay down the price for a ticket.

Somewhere in the hectic headlong rush into the jet age, however, there is reason to believe that the passenger is more likely to be forgotten than venerated once he has purchased his ticket. This is not universally true, of course, but we have a slight suspicion that the customer is often being treated today as he was in the earlier days—as a pliable and easily satisfied guinea pig quite amiably flexible and cooperative in developing this new experimental thing called air transportation.

Air transportation is no longer new or experimental, as the U.S. 1958 record of 24 billion passenger miles demonstrates. In most of the U.S. and the world the airlines now provide the only common carrier transportation worthy of the name. Airlines are the prime intercity and international passenger carriers. A heavy common carrier responsibility rests on management today that did not exist ten and twenty years ago.

The railroads in the U.S. took a solid licking for their indifference to passengers through many decades. When there was still a choice of travel the airlines attracted railroad customers by the tens of thousands, not alone because of speed but because of treatment by the rails. It is most important that the airlines do not themselves become critical targets for that same reason.

In an article in this issue the founder of Scandinavian Airlines System, Per A. Norlin, refers to "His Royal Highness the Passenger" as "a forgotten friend who, it is taken for granted, will always accept and pay for any kind of treatment, bad or good, and be grateful for it." It is imperative, he adds, that the airlines change this too-common attitude before the passenger wakes up and reacts.

The areas of vulnerability in passenger relations are many, but there are four which seem to us to be immediately pertinent.

One is the direct result of the rush into jets and turboprops. No management can afford to have $5 million units sitting on the ground or flying empty on trial runs for long, but the fact remains that the jets were rushed into advertised service before the carriers were really ready, although one cannot dispute in the slightest the eagerness of the public to try them out.

We think Eastern Air Lines took the most sensible approach with its turboprop Electras. Instead of advertising a formal start of service, Eastern substituted Electras unannounced here and there in the schedule pattern when the new equipment was ready. Thus passengers got unexpected dividends rather than disappointments when Electras were not available for mechanical reasons. The airline got utility of costly new equipment during the de-bugging period without risking the ire of customers.

A second vulnerable area is unrealistic scheduling with jets. Elapsed times were advertised in some instances that were unattainable most (if not all) of the time. At some point the airlines must face up to the fact that the public is not nearly as interested in the touted elapsed time as it is in knowing that advertised arrival times can be reasonably met most of the time. Early arrivals are dividends; consistently late arrivals due to unrealistic scheduling are warnings of more regulatory controls to come.

A third area is mechanicals. Every airline patron understands the inevitability of mechanical trouble. But it seems to us that there are far too many mechanical delays with piston equipment long in service. Is maintenance slipping? Staffing too thin? Spare parts too centralized? Is management more inclined to suffer delays than to spend more on prevention? We recognize that these questions do not pertain to all managements and all airlines. We also recognize that safety, by and large, is not involved. But aren't there too many mechanical delays with piston equipment that shouldn't be happening?

On the fourth score, just what is the value of a ticket with confirmed space? Take this sample: A teen-age school girl buys a ticket and gets confirmed space six weeks ahead. She has an international connection to make with parents waiting at the ultimate destination. The airline is forced by some reason or other to switch equipment with seven fewer seats available. Does the airline accept passengers on the basis of who checked in first, or on the basis of who purchased tickets first? Such an incident happened recently and the teen-age girl was left off because others, who had obtained space only a day or two before departure, had checked in earlier. This is the sort of irresponsibility which will plunge public carriers into trouble.

The airlines of the U.S. and the world have performed miracles in developing air transport to its present indispensable status. By and large, everyone is trying hard and acquiring grey hairs and ulcers in the doing. But a re-examination of mission by top management with passenger and common carrier obligations placed at the top of the list would seem to be in order almost everywhere.

Wayne W. Parrish

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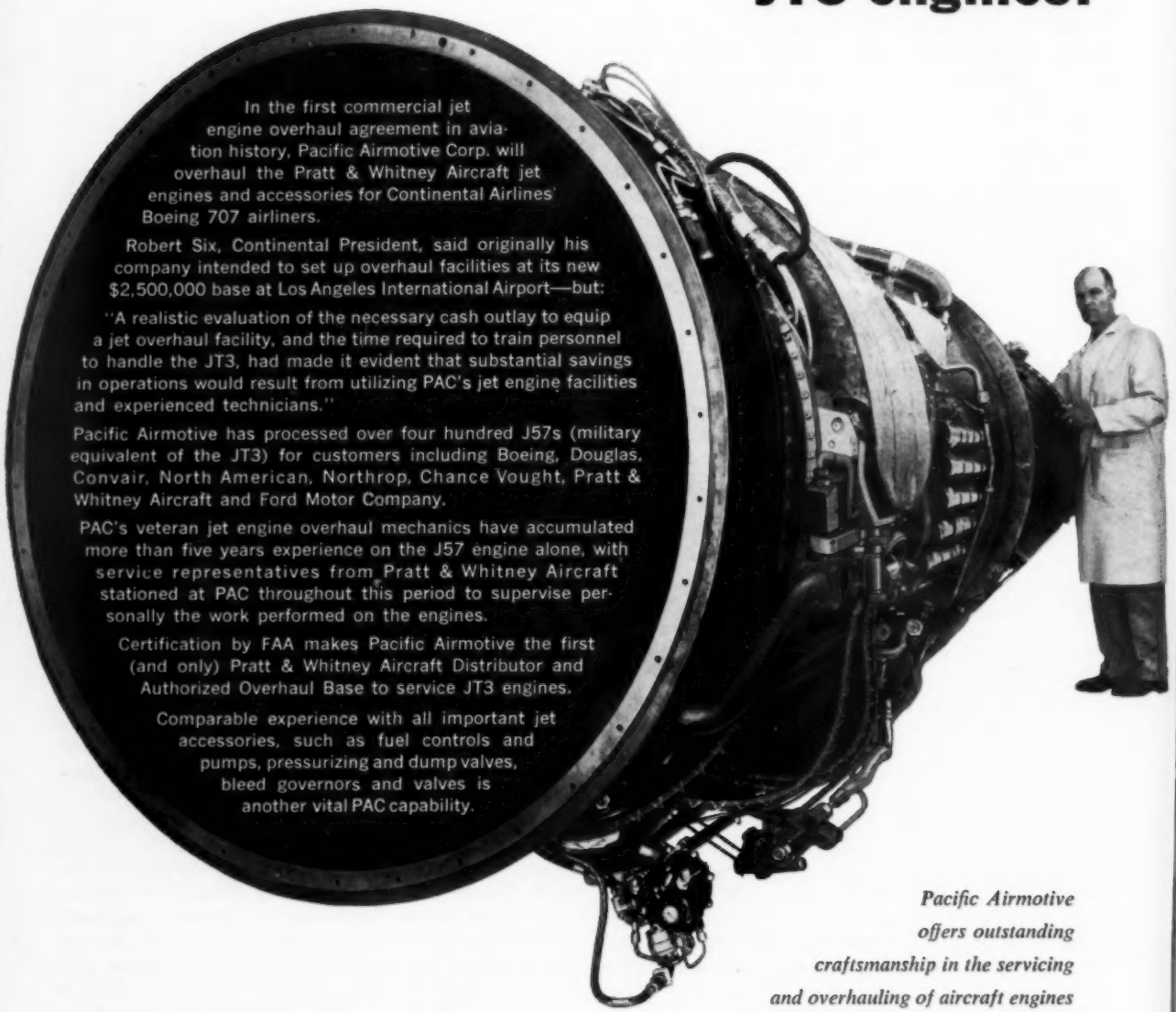

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6 MAJOR REASONS

why the '540' is the new challenger on short-to-medium routes!

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2 GROWTH CAPACITY TO MEET GROWING ROUTE DENSITIES

The Canadair-Convair '540' has the built-in capability of growing with the increased traffic densities that are forecast for the years ahead. It can do this because its **seating capacity can be increased by 20%** from 48 to 58 **without weight or operating penalty.** All fuel for terminal-to-terminal operation could still be carried.

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FIRST IN INTERNATIONAL AIR TRAVEL! This year marks Air France's 40th Anniversary as the world's first international airline. During these 40 years, there have been many changes in equipment, routes and airline philosophy. But one thing remains constant. Air France still follows the great tradition of French leadership in aviation. That's why this year, when other airlines are making plans, Air France is making history with the fastest jets in Europe and the Middle East. Next year, Air France will cover the world's largest route network with one of the largest pure-jet fleets in the world.

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Custom interiors, like the demonstrator shown above now on a nation-wide tour, are designed by AiResearch engineering specialists and interior stylists to meet individual company requirements. AiResearch conversion has increased the range of this superior business aircraft 50 percent over the commercial model and has increased the gross weight. Outer wing panel fuel tanks assure you one-stop, coast-to-coast flights with ample fuel reserve for instrument weather.

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Circle No. 27 on Reader Service Card.

There is some hesitancy about the following item since it is a bit long for this space, but since it was AIRLIFTED from a recent note from the Flight Safety Foundation it was decided to let you in on the story. It goes like this, the story teller unknown:

"When I boarded the plane, I chose a seat in the middle of the plane, sitting in front of a lady traveling with two youngsters; a boy about eight years and a girl about ten. After we were airborne about ten minutes, the lady got up with the two children by the hand and proceeded up the aisle to the lavatories—she put the little boy in one and she and the little girl retired to the other one. The little boy was in there about a minute, then emerged and marched down the aisle to his seat and sat down. A gentleman sitting in front of me with his wife, got up and went forward to the lavatory vacated by the little boy.

"He failed to lock the door. Immediately after this the lady and the little girl emerged. The lady opened the door of the other lavatory just a crack, said something hurriedly, and then closed the door and proceeded to her seat, only to be startled to see the little boy sitting there. She shrugged her shoulders and slunk down in the seat.

"About then the gentleman came back with the strangest look on his face and walked back to where his wife was sitting, reading a magazine.

" 'Gee, these stewardesses think of everything,' he said. 'Why?' asked his wife, looking up from her magazine. 'One of them just opened the door and told me not to forget my zipper, and I nearly jumped out of the window," was the reply.

"With that, the five or six people sitting in the vicinity who had been watching the proceedings, howled with laughter."

This incident of course leads to another that is being told on the American continent as well as in Europe and other places. The source is doubtful as both Delta Air Lines and Trans Australia Airlines are given credit, depending on who you talk to. It goes:

The mother called the airline and made reservations for herself and her two-year-old son. When she later approached the ticket counter she asked the agent if she would have to pay for the youngster. "You will have to pay half-fare," the agent told her. "Look," the mother said, in a confidential tone, "he was born two months premature, and if he had waited until he was due he wouldn't be over the age limit. Do I still have to pay for him?"

Going far afield from this sort of thing, cartoonist Jimmy Hatlo recently depicted in one of his nationally circulated cartoons a scene that is familiar to most general sales managers and causes them to join the ulcer circuit before their day is due. The cartoon shows some 20 passengers lined up in front of a single ticket position with several other positions marked "next window," but with ticket agents behind them discussing the time of the day. The caption on the cartoon reads: "Maybe it only seems that way—but—86 passengers divided by 12 standing-around clerks = one long slow line with 11 clerks left over."

These are trying days. Just like they were 25 years ago.

Of course Hatlo must remember that airline agents have their share of problems, too. For instance, they are frequently harrassed with bomb scares from people not properly adjusted to our society.

But even bomb scares sometimes have their humor. A recent one at a major airport brought out airline officials, airport officials and law enforcement officers for a usual check of baggage and such. A very dignified man of the cloth was most insistent that his baggage should not be disturbed and was quite haughty about the whole bloody mess. His pleas were in vain. He was taken into an inner office for a private baggage inspection. His baggage contained nothing but good old scotch whisk(e)y—not even a tooth brush!

Bill Ehart, former PR for National Airlines and now handling Napier publicity for Sam Tyndall Associates in Washington, passes on another brief passenger squib that deals with a woman passenger, who upon deplaning in New York after an NAL jet flight from Miami was overheard saying to a companion, "We can't be in New York already. I sat longer than this in a second-rate movie."

Since everyone is interested in statistics, everyone will be interested in knowing that Weber Aircraft Corp., manufacturers of various seating and related equipment, recently announced the sale to Air France of "5 complete lavatory compartments and one washroom compartment." What AIRLIFTS would like to know is how long is the line waiting outside the one washroom compartment?

Big jet in a jam

Wide World Photo

American Airlines is no newcomer to the art of establishing "firsts," and doing same is an almost day-to-day routine since they started the first transcontinental service with jets. Just recently, however, they established what may be history-making, but was a bit alarming at the same time. Their nonstop flight to Los Angeles had to put down at Phoenix due to weather conditions at L.A. Unpleasant this might have been, but when the crew stepped off the plane they were informed by uniformed police that the Boeing 707 they had just landed was impounded. The picture here shows the plane, flanked by Phoenix police and police patrol cars, as it waits for liability insurance questions to be settled. It happened that the Phoenix airport—like most airports—did not have insurance that covers the landings and takeoffs of jet aircraft. Fortunately, all worked out well and AA scored still another "first."

See your travel agent or call TWA

TWA

TRANS WORLD AIRLINES

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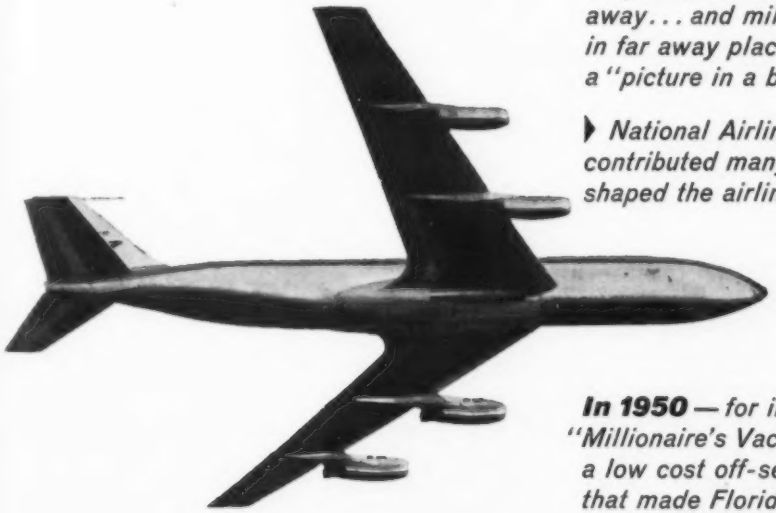
★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

New Ideas as well as new equipment make our economy strong



▸ *Ideas are as important to an airline as equipment. The air transport industry has progressed in only two decades from a few uncertain mail routes to a vital link in the nation's economy, because the men who built it had the vision to see years ahead.*

▸ *These pioneers had no rules to guide them. But their imaginations had wings, and because of this a businessman today can "Stay close to Home" while thousands of miles away... and millions can afford to vacation in far away places that used to be only a "picture in a book."*

▸ *National Airlines is proud to have contributed many of the new ideas that shaped the airlines industry.*

In 1950 *— for instance, National introduced the "Millionaire's Vacation on a Piggy-Bank Budget" — a low cost off-season package vacation plan that made Florida and Cuba vacations possible for millions. And at the same time made these areas year-round resorts instead of seasonal.*

National pioneered *in radar, equipping its entire 4 engine fleet for more comfortable over-the-weather flights.*

Thanks to a unique idea *in reciprocal leasing of equipment, National was first with jets in the U.S.A. — a development that benefited the public as well as the two carriers involved.*

Now — National, *in a bid for a share of the private automobile vacation market has filed an experimental tariff which provides the lowest air fares in scheduled airline history. By flying National's night coaches on certain days, a couple can fly from New York to Florida more cheaply than they can drive their own car.*

Many *of National's new ideas have been of wide-spread benefit to the industry. National believes that this experimental tariff could result in creating a vast new market of air travelers. This is essential if the expanded air fleets of the future are to fly at profitable load factors.*

NATIONAL

Airline of the Stars

★ ★ ★ ★ ★ ★ ★ ★ ★

The Airline with the New Ideas

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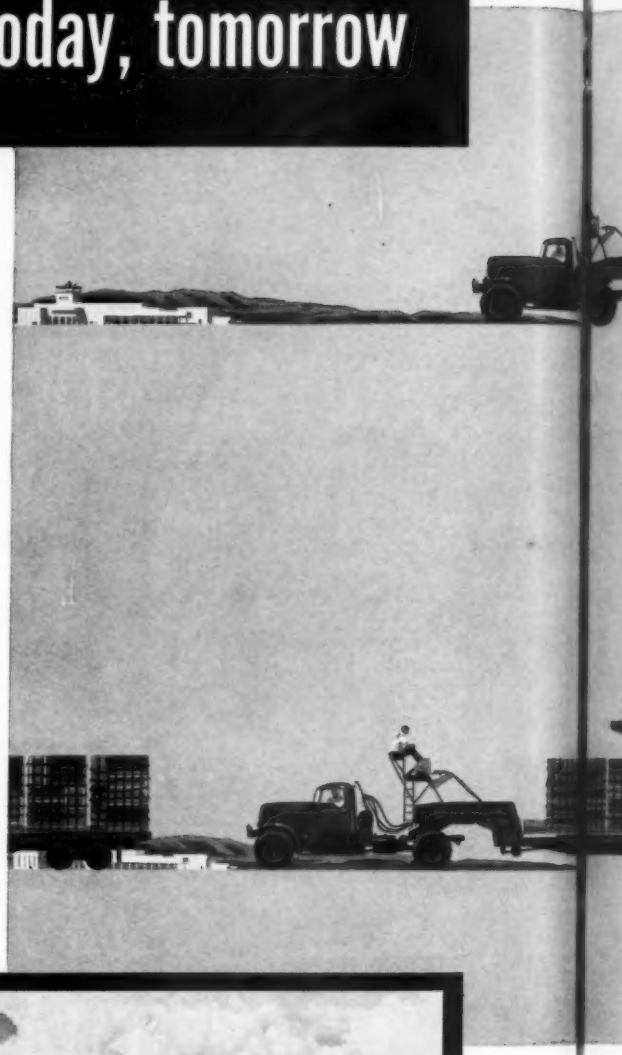
Lockheed's HERCULES Airfreighters –
Your profit-partners: today, tomorrow

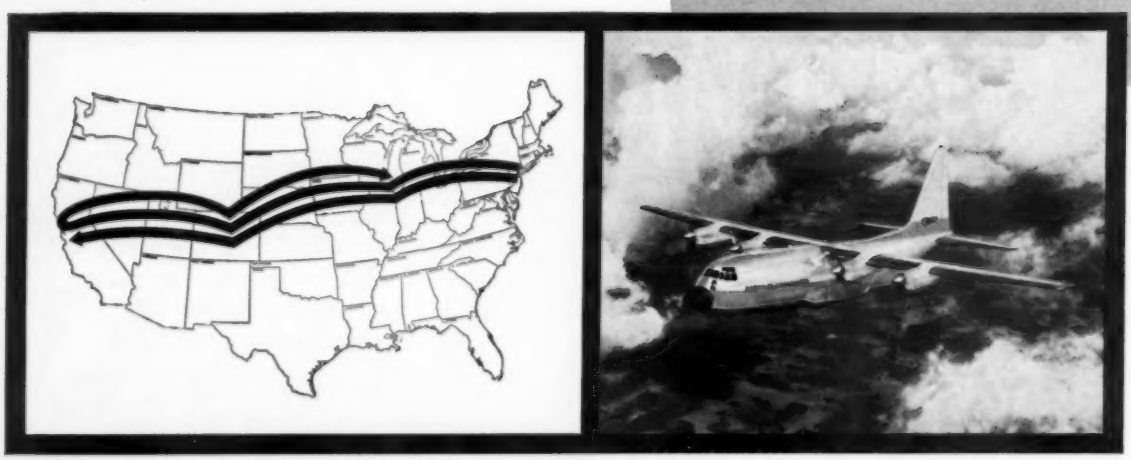


Designed to haul the goods of the world in the Jet Age, the Lockheed HERCULES Airfreighter has a profit-making edge over any other cargo hauling aircraft now flying.

One important advantage is the Lockheed-developed Lightning Loader system. With it you can winch 22 tons of palletized cargo in or out of a HERCULES Airfreighter in only 40 seconds!—saving hours of ground time.

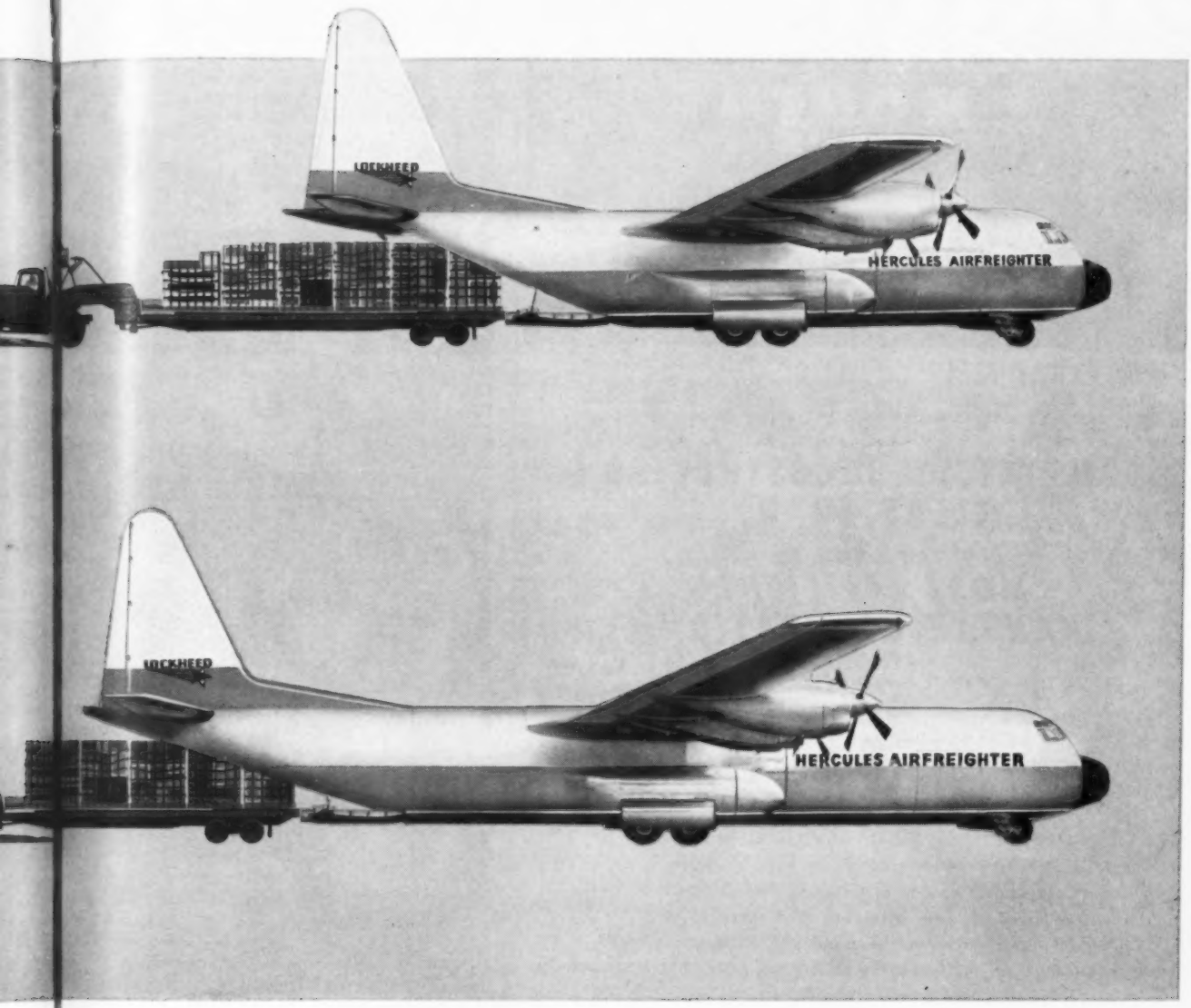
Looking ahead to the time when air cargo volume demands more payload capability, Lockheed again has the answer—the bigger, longer-ranged SUPER-HERCULES Airfreighter, which can bring direct operating costs down below 4 cents per ton mile. And pay you a handsome profit doing it.

To compete for air cargo profits today, the HERCULES is your best buy. Then, when your volume warrants it for your heavy volume, long range routes, add the new SUPER-HERCULES Airfreighters—retaining the HERCULES on other routes to give you a completely integrated operation.



Map compares cross-country flights of Prop-Jet HERCULES Airfreighter, using Lightning Loader system, and fastest type piston-engine cargo transport. Both leave New York with identical 20-ton cargoes, make same en route stops, unload and reload identical cargo at each stop. By the time piston-engine plane arrives in San Francisco the Lockheed HERCULES Airfreighter has reached Chicago on return trip.

Over-the-weather capability of the HERCULES Airfreighter is an important profit-making plus. "On time" deliveries of air cargo keep today's customers happy, build air freight volume and profits for the future.



TOP ILLUSTRATION: **Today's HERCULES Airfreighter,** using Lockheed's Lightning Loader system, can land, unload entire 6-pallet, 22-ton payload, reload, and take off—in less than 20 minutes time!

BOTTOM ILLUSTRATION: **Tomorrow's SUPER-HERCULES** Airfreighter has 23-foot longer fuselage, greater wingspan, maximum 10-pallet, 39-ton payload capability—plus same Lightning Loader system.

LOCKHEED

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NUCLEAR-POWERED FLIGHT • ADVANCED ELECTRONICS • AIRBORNE EARLY-WARNING AIRCRAFT • AIRPORT MANAGEMENT
NUCLEAR REACTOR DESIGN & DEVELOPMENT • GROUND SUPPORT EQUIPMENT • WORLD-WIDE AIRCRAFT MAINTENANCE

HANGAR of the MONTH*

*Pictured above is the "Hangar of the Month". This modern hangar is the joint base for three large executive airplanes of General Electric, American Can and U.S. Industries. The 133' depth and 640' width efficiently hangars executive planes of any size.

COMPLETELY UNOBSTRUCTED CLEAR SPAN for the *MOST EFFICIENT HANGAR UTILIZATION*

ERWIN-NEWMAN Suspended Cantilever Type construction eliminates the outmoded hangar problem of having to spot planes in a hangar full of obstructing supporting columns. From one end to the other there is nothing but wide open unobstructed clear span hangar work area when you construct a modern ERWIN-NEWMAN hangar.

ERWIN-NEWMAN hangars are built with an expandable future in mind. The length can be enlarged and still have clear span space up to several hundred or several thousand feet. Vertical clearance can be increased, in the future, by adding tail gates at any number of points across the front.

Our years of experience in design and construction make it imperative you consult with us when you plan a hangar of any size (no obligation of course).

Due to certain patent infringements it is necessary to publish this

IMPORTANT PATENT NOTICE

The Erwin-Newman Suspended Cantilever Hangars are covered by United States Patent No. 2,687,102, and similar foreign patents issued to us and under which we hold exclusive rights. We have not (at this writing) issued any licenses of other authorization for the design, engineering, construction, or use of these patented hangars. The Erwin-Newman Company must, and will, protect its rights under these patents against infringements.

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DESIGNERS AND CONSTRUCTORS
U. S. Patent No. 2,687,102
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WORLD WIDE AIRCRAFT DEALER

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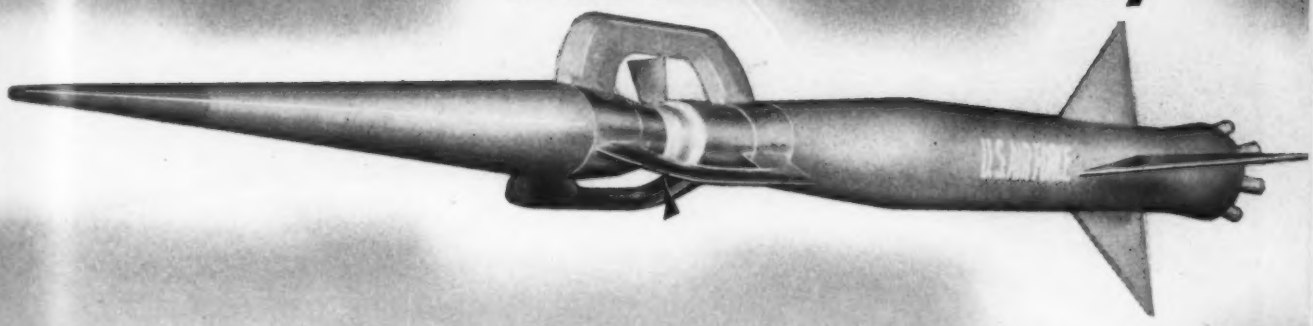
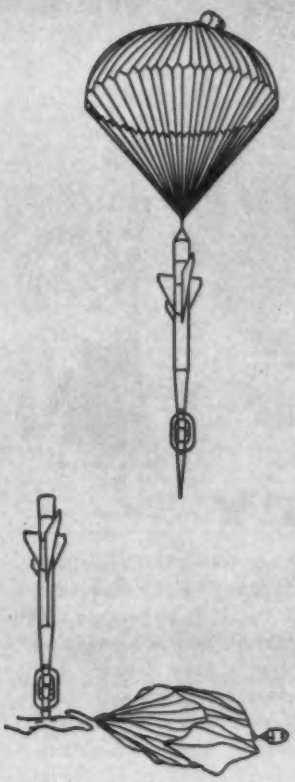
APGC..

– Symbol of teamwork with American Industry





The AIR PROVING GROUND CENTER, located at Eglin Air Force Base, Florida, is one of the test and development centers of the AIR RESEARCH AND DEVELOPMENT COMMAND of the USAF. As part of its overall mission, APGC is responsible for research, development, test, and evaluation of guns and other aircraft weapons, ammunition, rockets, bombs (except nuclear weapons), fire control components and systems. Typical of the development programs being conducted by APGC is the TDU-9/B supersonic tow target. This unique target, designed and produced by Hayes Aircraft Corporation, provides years-ahead capability to the Air Force in the training of personnel in missilery, rocketry, and modern gunnery.

The TDU-9/B target provides realistic simulation of full scale aircraft and missiles. Constructed of sturdy reinforced plastics, the target contains equipment for a number of specialized missions. Included in this equipment are a scoring device, radar tracking beacon, radar augmentation, infrared radiation augmentation, visual augmentation, and a command receiver. The reliable recovery system insures reuse of the target and economical operation. The overall system reflects the technical team work between APGC and Hayes Aircraft Corporation.

The TDU-9/B tow target development is one of several contracts which Hayes Aircraft Corporation has with the Air Proving Ground Center. As such, it is another fine example of the Air Force-Industry team working towards a more secure America.

RESEARCH, DEVELOPMENT & TECHNICAL PERSONNEL are needed by Hayes Aircraft Corporation to participate in modern weapons system and component design and manufacture. With more than 10,000 employees, Hayes is currently active in both missile and aircraft production and is conducting research and development in many diverse fields. We welcome your inquiries. For further details, write to Personnel Director, Department 405, P.O. Box 2287, Birmingham, Alabama.

Hayes
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A PROGRESS STORY

AIR-INDIA International is about to enter the Jet Age. Our first Boeing 707 Intercontinental Jetliner, one of an initial order of three, is due for delivery in late 1959.

This is Progress. It is also an appropriate moment to review our status as a major world carrier, and our achievements as we move into our twelfth year.

AIR-INDIA serves 26 cities in Europe, Asia, Africa and Australia. In past year, nearly 100,000 passengers flew over our network of more than 21,617 unduplicated route miles, aboard our Super-G Constellations.

Other significant developments of the past year: a new route from Delhi via Tashkent to Moscow; addition of Jakarta as a new destination via Singapore; a third weekly flight to Tokyo; a new all-cargo service between India and London; and expansion of our offices and staff in New York and Los Angeles.

To AIR-INDIA International, Progress has but one meaning: *Better service, world-wide*—for our partners in aviation.

AIR-INDIA *International*

425 Park Ave., New York 22, N. Y. • Tel. PLaza 1-4146

Los Angeles: 543 So. Olive St. • Tel. MAdison 6-6834

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When & Where

MAY

May 4-6—Institute of Radio Engineers, Dayton Section, 11th national aeronautical electronics conference, Dayton, O.

May 4-14—IATA, 12th Technical Conference, Hotel Claremont, Berkeley, Calif.

May 5-7—California Assn. of Airport Executives, annual meeting, Monterey, Calif.

May 7-9—American Helicopter Society, 15th annual national forum, Washington, D.C.

May 18-21—Society of Aeronautical Weight Engineers, 18th annual national conference, Hotel Henry Grady, Atlanta, Ga.

May 20-22—American Society of Civil Engineers, 2nd Jet Age Airport Conference, Shamrock Hilton Hotel, Houston, Tex.

May 26-28—Institute of the Aeronautical Sciences, San Diego Section, regional meeting on supersonic transports, San Diego, Calif.

May 28-31—Federation Aeronautique Internationale, annual conference, Moscow.

JUNE

June 4-5—Institute of Radio Engineers, third national conference, Villa Hotel, San Mateo, Calif.

June 5-6—Reading Aviation Service, Inc., 10th annual maintenance & operations meeting, Reading, Pa.

June 9—ATA board of directors meeting, ATA conference room, 1000 Connecticut Ave., N.W., Washington, D.C.

June 12-21—International Air Show, Le Bourget, Paris.

June 16—Aeronautical Radio, Inc., bd. of directors meeting and ARINC Research Corp. directors meeting, Washington, D.C.

June 23-25—Aviation Distributors and Manufacturers Association, 33d meeting, St. Francis Hotel, San Francisco.

JULY

July 14-15—Airlines Electronic Engineering Committee, Ambassador Hotel, Los Angeles, Calif.

July 16-17—Radio Technical Commission for Aeronautics Assembly, Ambassador Hotel, Los Angeles, Calif.

July 28-30—Air Cargo, Inc. annual airfreight cartage convention, Chicago, Ill.

SEPTEMBER

Sept. 3-6—Air Force Assn. Convention and Panorama, Miami Beach, Fla. (Make reservations with AFA Housing Bureau, P. O. Box 1500, Miami Beach, Fla.)

Sept. 7-13—Society of British Aircraft Constructors, annual flying display and exhibition, Farnborough, Hants, England.

Sept. 30-Oct. 2—Southeastern Airport Managers Association, Durham, N.C.

OCTOBER

Oct. 5-10—Society of Automotive Engineers, national aeronautics meeting, aircraft manufacturing forum and aircraft engineering display, The Ambassador Hotel, Los Angeles.

Oct. 10-15—National Association of State Aviation Officials, 28th annual meeting, Mark Hopkins Hotel, San Francisco.

Books

Handbook on Electrical Circuits

Aircraft Electricity for the Mechanic. By C. E. Chapel. Published by Aero Publishers, Inc., Los Angeles. 448 pages. Price $5.

As the title implies, this book gives an explanation of the theory and operation of common aircraft electrical circuits. It includes many diagrams, charts, and tabular material to aid the technician who is not an electrical specialist.

At the end of each chapter a list of questions bears out the important content, providing a useful gauge of the student's progress. Mathematical computation and extranenous physics is held to a minimum, making the text a very close-written source of valuable information.

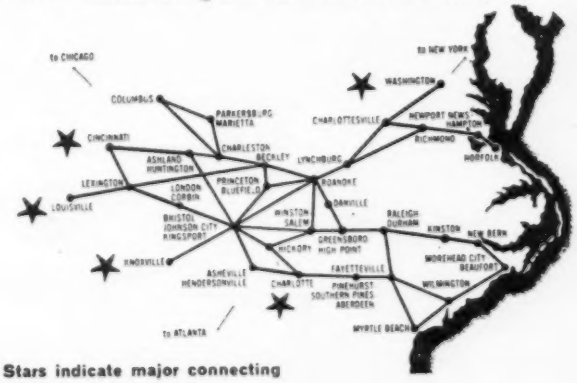
CONNECT TO PROP-JETS

along Piedmont Airlines' route of the pacemakers

Piedmont Airlines has now placed eight F-27 prop-jets in service on its seven-state system. These modern airliners, especially designed for faster, more convenient regional flight service, have been enthusiastically approved by thousands of passengers. And thousands more will enjoy the luxury and comfort of F-27 Pacemakers in the months ahead.

In 1958 Piedmont continued to show significant growth in traffic and attained the highest load factor in the local service industry—52.3. Now with 20 F-27 prop-jet flights daily—and more planned—Piedmont is generating an increasing volume of air travel.

Now more than ever before, interline connections with Piedmont are good business all around.



★ Stars indicate major connecting points for F-27 service

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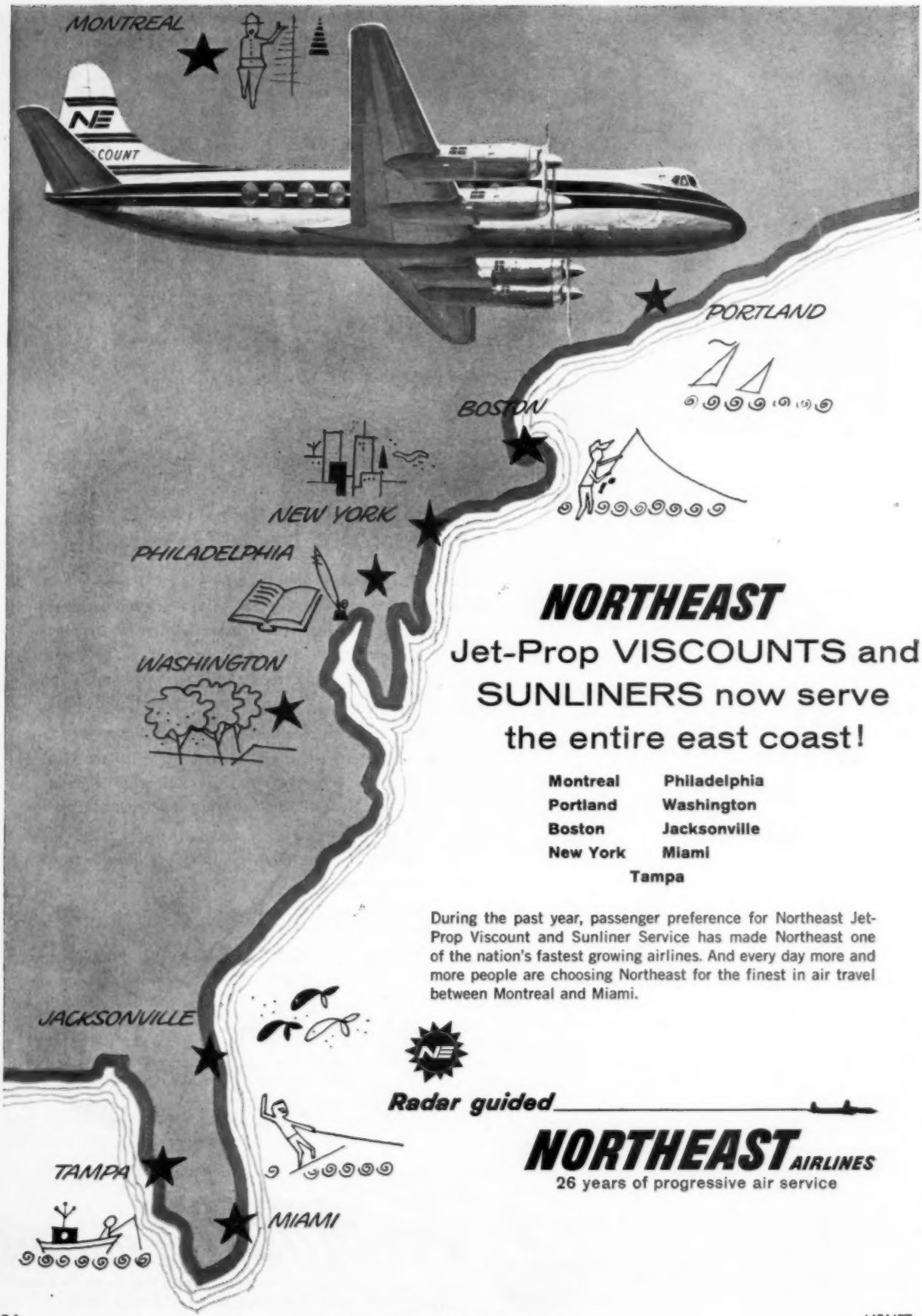

NORTHEAST

Jet-Prop VISCOUNTS and SUNLINERS now serve the entire east coast!

Montreal	**Philadelphia**
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Boston	**Jacksonville**
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During the past year, passenger preference for Northeast Jet-Prop Viscount and Sunliner Service has made Northeast one of the nation's fastest growing airlines. And every day more and more people are choosing Northeast for the finest in air travel between Montreal and Miami.

Radar guided

NORTHEAST AIRLINES

26 years of progressive air service

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Reply to Mr. Butler

To the Editor:

Much of Mr. Butler's article on "What's Wrong with Aircraft Interiors" (AIRLIFT, April) is paradoxical. On the one hand, the author represents himself as an expert with an understanding of the engineering, manufacturing and operating problems of an airplane; we have no disagreement with this representation. On the other hand, the general questions, complaints and non-recognition of the major airframe manufacturers' and airlines' present interior design practices are those which an inexperienced lay traveler might express.

To elaborate, any interior design must comply with three of the primary design requirements of any commercial airline transport airplane: (1) Safety; (2) Economy of Operation and Maintenance, and (3) Passenger Service.

Item one speaks for itself. Without item two, the third requirement will not exist because an airline could not afford to purchase the airplane, much less to offer the service to the public. To this, the Passenger Service Department will answer (and rightly so) that unless passengers are properly served (or in the seats to be served) there will be no operation, economical or otherwise. These opposing statements serve to highlight the fact that today's (and yesterday's and tomorrow's) airliners represent a series of compromises in all aspects—Passenger Service, Flight Operations, Maintenance, Ground Operations, Sales Appeal, etc. This, of course, is not a profound or new concept, just a well established fact. However, contrary to Mr. Butler's statements that the airlines and manufacturers minimize the requirements of Passenger Service Departments and Interior Designers, consider the following (representative of all major airlines and manufacturers):

1. The Passenger Service Department (as well as all other major departments) assists in the formulation of all TWA aircraft specifications. Close follow-up is maintained and improvements are made throughout the manufacturing stages.

2. Boeing has employed, since 1946, an interior decorator consultant with a full-time resident representative and large staff. This representative, Mr. Frank Del Giudice of Walter Dorwin Teague Associates, works closely with Boeing engineering personnel and is aware of the operating and maintenance problems connected with airplanes. Mr. Del Giudice enjoys the confidence and respect of all Boeing's customers, particularly TWA, who have relied greatly on his services. The very gratifying response of the traveling public to TWA's 707s is an indication that our interior conception is sound.

3. Convair employed two organizations, Harley Earl, Inc. as functional designer and Dorothy Draper as interior decorator, for the 880 interior layout. While both designers are new in the aircraft business, they performed an outstanding job behind the guidance of Convair, Delta and TWA.

However, with all this talent available, no one has been able to devise an acceptable interior which in basic arrangement is greatly different from that in a DC-3. People still sit in seats. The average human body is about the same size and shape as heretofore, etc. The basic problem is the *high cost of airborne real estate*. If the airlines are to continue to provide the extensive technological improvements of the last two decades (with a minor increase in cost to the flying public), then the cabin space must be utilized as efficiently as possible. Many alternate interiors have been investigated, but rows of passengers are still the most efficient. Excessive compartmentation decreases the passenger load. If hat racks were eliminated, equivalent storage space would have to be provided elsewhere—and again passenger space is lost. In other words, the airlines could provide "executive" type seating and interiors, but few passengers would be willing to pay the appropriately increased fare.

But, let's look at the positive side of the picture—the passenger service improvements since DC-3 days—Non-stop international and domestic operation, more cheerful decorations, improved air conditioning (although the extremely broad range of environmental conditions encountered by a jet airliner does make difficult the development of a system equivalent in performance to that in a modern hotel), hat racks which can be loaded with bulky objects (under or behind nets), one-fourth the flying time between distant points, decreased air turbulence, hot cooked meals, beverage service, etc. And don't forget, as mentioned before, all these improvements are available at virtually the same cost as to ride a DC-3 in 1939.

In summary, we believe that the air-

make a note of this . .
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Dependable, uniform high quality PERFECTION® Brand Communication papers, in rolls and folded, assure smooth efficient operations in every phase of modern day life to speed TRANSMISSION OF VITAL INFORMATION instantaneously.
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LETTERS

lines and manufacturers have kept abreast with the "state-of-the-art" in interior design as well as in mechanical features. No strikingly different interiors will become feasible until major break-throughs are accomplished in aerodynamics and power generation, and/or unitl airplanes are not subject to weight and space limitations. Until then, however, our doors are open to any individual or firm who can provide us with a more attractive and comfortable interior, with equivalent or higher passenger utilization, and at equivalent or less weight.

W. H. SPANNUTH
Manager—Airframe Engineering
Trans World Airlines, Inc.

It Makes A Difference

To the Editor:

In reviewing the statistical data on page 45 of the April issue of AIRLIFT magazine, I noted that data shown for Southern Airways was actually Piedmont's statistics and vice versa.

I am enclosing a sheet giving Southern Airways' revenue statistics in the hope that you may be able to correct this in one of your later issues.

I thought the new cover for AIRLIFT was most attractive and I am sure that the wonderful job that you all have been doing shall continue . . .

ARCHIE D. YAWN
General Sales Manager
Southern Airways, Inc.

Editor's Note: GSM Yawn is correct. Somewhere along the line we did a vice versa and the data for Southern's 1958 report got mixed with Piedmont's. Naturally this throws the percentages out of gear, too.

Powerplant Feud

To the Editor:

I'm having a minor war, by correspondence, with a fellow called Van Duzer who is Sales Promotion Manager of Eastern Air Lines.

Van D insists that it is fit and proper—and moreover, as he puts it, "factual"—to describe the Electra as "jet-powered;" because, as Van D explains it, the "engine is a jet-turbine driving a propeller."

The problem of when is a turboprop (or prop-jet) to be called a jet, probably depends upon what percentage of the thrust is attributable to the tailpipe. But this ignorant fellow evidently thinks that a jet engine is so called because the turbine is driven by a "jet" of hot gases impinging upon it. On this basis, a ram- or pulse-jet isn't a jet at all because it has not a turbine, nor a turbine nozzle; hence, no "jet" in Van Duzer's language.

Of course, the popcorn manufacturers have been misusing the word "jet" in their ads for years, simply to signify space-age modernity and so forth; but then the popcorn foundries did not have to wait for Boeing, Lockheed and Allison to get their fingers out and produce something that flies, and I suppose Eastern got tired of waiting.

This however does not provide any excuse for the folly of Van Duzer. Or Duz it?

COLIN NICHOLSON
Rosemere, Quebec

Editor's Note: We don't want to get

FLY EASTERN'S GOLDEN FALCON

JET-POWERED ELECTRA

ALL FIRST CLASS—NO EXTRA FARE

Only Eastern's Long-Range Electra offers all these advantages:

★ **JET-POWERED SPEED**—well over 400 miles an hour! Save extra time with convenient carry-on, carry-off baggage facilities and built-in boarding steps.

★ **JET-POWERED DEPENDABILITY**—relax with confidence! Ample fuel capacity assures completion of long-range non-stop flights.

★ **JET-POWERED QUIETNESS**—arrive refreshed! Enjoy a new sensation of quiet, restful flight, as the most advanced radar guides you through the smoothest air.

★ **JET-POWERED LUXURY**—true living-room comfort! Larger cabins, wider seats—all two abreast and reserved. And, of course, all these Eastern extras—delicious complimentary meals, choice beverages, foam rubber footrests, spacious lounge, built-in air conditioning and the world's finest, friendliest service!

EASTERN AIR LINES

31 YEARS OF DEPENDABLE AIR TRANSPORTATION

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MOHAWK IS NOW OPERATING FROM
ITS NEW $3 MILLION HEADQUARTERS PLANT

Among other innovations are the permanent work docks which close around the aircraft allowing maintenance men to work efficiently on every area of the plane. This new facility is truly a model for the airline industry.

Complete System ROUTE MAP

MOHAWK
AIRLINES
The Route of the Air Chiefs
EXECUTIVE OFFICES: UTICA, NEW YORK

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LETTERS

into this one. This battle of words over engines has been going on a long time. Industry will some day have to get together and make a decision. AIRLIFT decided some time ago that for editorial purposes there are two engines: jets and turboprops.

Thank You, Gentlemen

To the Editor:

The copy of AIRLIFT is a beauty. Paper, typography, layout are all excellent. The concept is sharp and clear—and I think you will have the aircraft market by the tail.

Congratulations—and best of luck.

S. H. McALONEY
Ford Instrument Co.

To the Editor:

I have just read with great interest the first issue of AIRLIFT.

It is a most worthy successor to AMERICAN AVIATION and will continue, I am sure, on an even greater scale the fine tradition and reputation which your publications have established during the past 22 years.

Best wishes for your continued success.

RALPH J. OSBORN
President
Lockheed Aircraft Service, Inc.

To the Editor:

Congratulations.

To me AMERICAN AVIATION as a publication was an old and very personal friend, dating back to when it originally became a true voice for commercial air transportation.

But my fears were groundless. AIRLIFT is a delightful Spring tonic for anyone who is infused with air transportation blood.

EMERY F. JOHNSON
President
Air Cargo, Inc.

To the Editor:

AIRLIFT is an exceptionally distinguished magazine which will fill a need for the world of military and civilian aviation. We send our best wishes for its continued success.

COL. M. H. GILMAN
Department of the Air Force

To the Editor:

AIRLIFT has a new, good breeze to it. I like the type make up and the art layouts. Congratulations, you scored again.

KEITH KAHLE
President Central Airlines, Inc.

To the Editor:

Congratulations on your first issue of AIRLIFT magazine. I have been through it from cover to cover in great detail and consider this to be an outstanding kick-off to a magazine which all of us in the industry can call our own.

DAVID H. BAKER
Capital Airlines

To the Editor:

Our congratulations and best wishes in the launching of AIRLIFT. As in the past, you have come up with a comfortable, easy-to-read format.

CHARLES BUTLER
New York, N.Y.

THE U.S. TREASURY SALUTES THE AIRCRAFT INDUSTRY

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L. A. MARTIN, skilled aircraft mechanic, is typical of the thousands of valued employees in this field who are buying U.S. Savings Bonds regularly. Mr. Martin, through his company Payroll Savings Plan, is making a personal contribution to the Peace Power of his country.

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1st Quarter Traffic Shows Gains

Trunkline traffic was good in the first quarter. Big coach gain was the principal factor. Results would have been even better had it not been for January strikes. Passenger-miles for the three months were 6.25 billion, up 7.9% over same 1958 period. Available seat-miles rose only 4.8%, boosting load factors. First-class passenger-miles gained only 1.4% while seat-miles dropped 1%. But coach passenger-miles jumped 18.5%, seat-miles 14.7%. March was the big month, with passenger-miles (both classes) running 14.4% ahead of last year.

President Eisenhower won't name an aviation advisor to replace E. R. Quesada, who resigned the post when he became FAA Administrator. Many of the advisor's duties are now the responsibility of the Administrator. The President, on Quesada's recommendation, also has the Budget Bureau looking into the possibility of a new inter-agency aviation committee to replace the Air Coordinating Committee.

New York's Idlewild A Big Airport

Some idea of the size of New York International Airport can be seen from the fact that almost a quarter of a billion dollars have already gone into the field and facilities—and this doesn't include airline expenditures. Port of New York Authority's investment at the end of 1958 was $211.5 million. Federal aid totals $8.8 million.

Current competition for a military jet cargo transport is for 10 to 12 planes, but Air Force ultimately will buy 25. It would like to have 50, but has to compromise on funding. Competition is for an off-the-shelf model, so price can be a factor in the selection. Boeing, Convair and Douglas have submitted proposals.

Air Transport Rates First

Airlines have the greatest potential for expansion of any industry that competes for the consumer dollar. That's the conclusion reached in a little-publicized postwar study of personal spending habits by Commerce Department's Office of Business Economics. Consumers are selective in what they buy as their income rises. For example, postwar spending for furniture and TV has a factor of 1, meaning that such spending goes up directly in proportion to increases in disposable income. Airlines have a factor of 3—highest in the study. Transportation as a whole is rated only .9; prospects for railroads and buses are "negative."

Here's what the shift in Capital Airlines' board of directors means: Charles Murchison, new head of the executive committee (p. 34) will handle policy and financial matters, leaving President David Baker more time for day-to-day operations. Naming of Murchison and of "elder statesman" George Hann as board chairman will help unite factions on the board. Murchison eventually will become board chairman.

Search for Baggage Fix

Flimsy baggage is on the airlines' agenda for action. Easily-damaged bags result in numerous complaints. Industry is considering getting together with luggage manufacturers, hiring an independent testing lab, and establishing suggested standards for baggage construction. It's a long-range program; airlines won't firm it up until fall.

Look for major announcement by the Army of a design competition for a VTOL aircraft. Feeling among top officials is that it's time to move ahead, that there's been more than enough testbed activity.

Big Need, But Low Priority

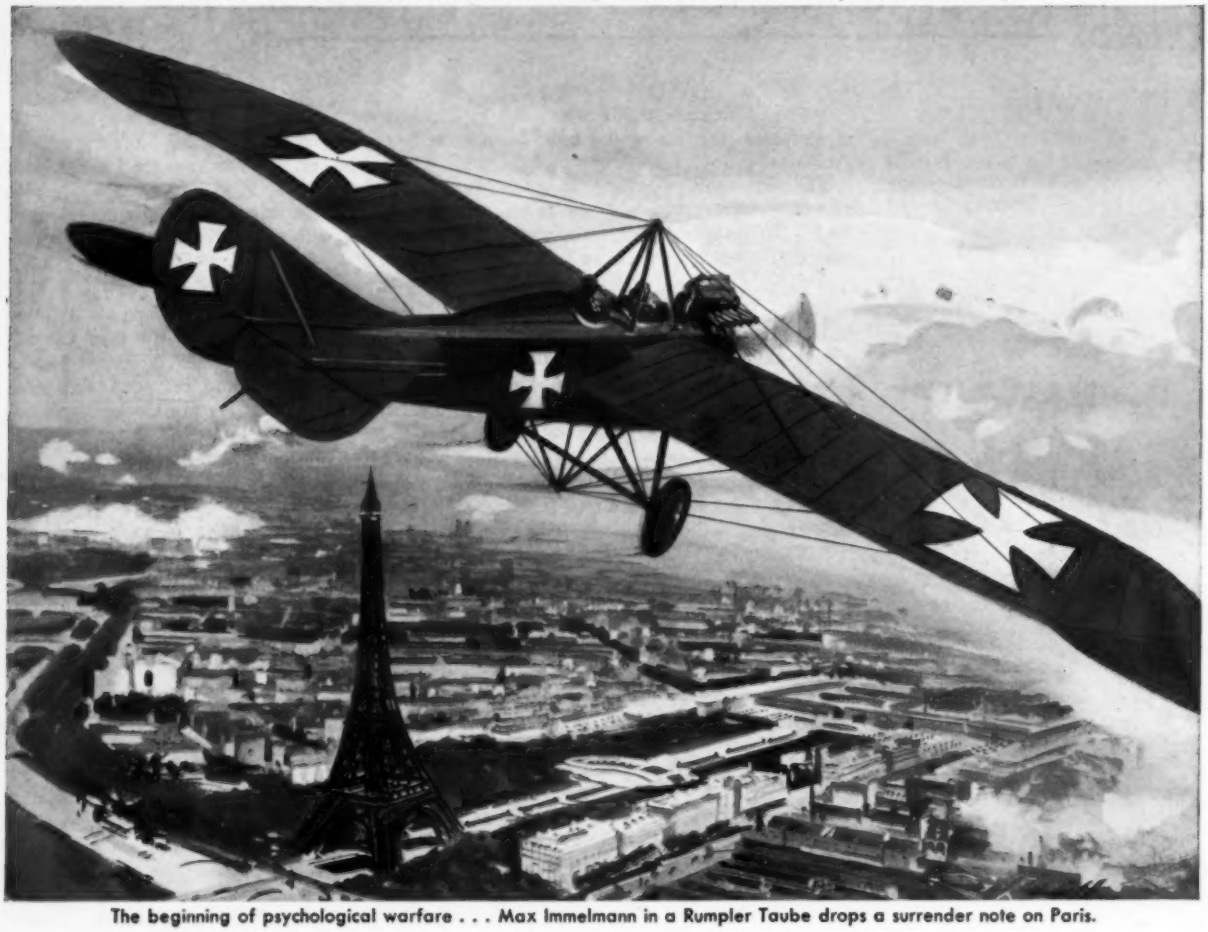
Air Force is trying to decide whether it should continue to fund the Allison T61 turboprop engine. If it does, the two-spool engine, developing 5500 equivalent shaft horsepower, will be ready for testing in late 1960. Proponents argue that the powerplant is needed for transport operations, where range and economy are important. But the question, as always, is whether money will be found for an engine that would be used only for the unglamorous but necessary job of logistics.

Lounge seats on DC-8s will be sold by United Air Lines. This is a major switch in passenger service policy. Reasons: added revenue, seats are more comfortable than present lounges, some passengers desire lounge seating, groups traveling together can buy this space. UAL will have 40 first-class seats plus eight lounge, 66 coach with five lounge. Thus UAL picks up 13 seats. American and TWA are not selling lounges.

Turboprop Test by Allegheny

A deal is being worked out by Allegheny Airlines to get a Canadair 540 turboprop for use this summer on its Pittsburgh-Atlantic City-Washington route. Airline and manufacturer will share costs of the program. Purpose is to test the 540 in scheduled operation.

For a 14" x 10" lithographic print, suitable for framing, write Aviation Division . . . Request Historical Series #2.



The beginning of psychological warfare . . . Max Immelmann in a Rumpler Taube drops a surrender note on Paris.

Early War Birds—THE RUMPLER TAUBE

When World War I began, Germany had about 100 first-line observation planes of the "bird" or Taube type—so called because the shape of their wings and elevators gave them a bird-like appearance in flight. Of the various Taube designs of the period, the Rumpler two-seater was one of the most successful. Equipped with a 100 h.p. Daimler engine, it boasted a top speed of 75 m.p.h. and was especially noted for its high-flying qualities, holding a world's altitude record of close to 20,000 feet. The French had dubbed the Rumpler Taube, "the invisible plane", because the clear doped wings of some models made them almost impossible to spot at higher altitudes.

When the German Army stood at the outskirts of Paris in the early weeks of the War, a Rumpler Taube, piloted by Lieutenant Max Immelmann, flew lazily over the city. Although nothing more lethal was dropped than a note exhorting them to surrender, the Parisians were awakened to danger of air attacks. Immelmann and his Rumpler Taube foreshadowed new offensive uses for airplanes.

Immelmann, a brave and skillful flyer, went on to become an outstanding fighter pilot and, at the time of his death in June, 1916, was Germany's leading "Knight of the air." He is best known for the maneuver he devised—"The Immelmann", a half loop with a roll-out on top.

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Examiner Opposes BOAC Tokyo Stop

In a highly significant report, CAB Examiner Ferdinand Moran said a stop at Tokyo by British Overseas Airways Corporation on its route from the U.S. across the Pacific is not in the public interest. It would result in "damaging diversion of revenues" from U.S. airlines, he warned.

Northwest Airlines fought the Tokyo stop in hearings before Moran. If the report is upheld by CAB and the President, it will mark the first time the U.S. has refused, on public interest grounds, to grant a route covered in a civil air agreement.

Moran said that while the U.S. has obligations under its air agreement with the British, the public interest must also be considered. "The public interest does not permit the large diversion by BOAC from U.S. carriers in the Tokyo-transpacific air market . . ." he said. "This . . . market has been gradually developed by Northwest and Pan American through approximately $90 million of U.S. . . . subsidy support." He estimated diversion from U.S. lines at $15 million a year, and added: "The Tokyo-transpacific market . . . is composed of traffic to which BOAC has no primary claim under the Bermuda agreement, since over 99% would be Fifth Freedom to BOAC." He recommended that the British line operate London-Hong Kong via New York, San Francisco, Honolulu and Wake Island.

Qantas Refused U.S. Traffic

A foreign airline serving two or more U.S. points can carry between such cities only the traffic which it brings into or takes out of this country, CAB ruled.

Qantas Empire Airways, which crosses the U.S. on its round-the-world route, had requested the ruling. The Australian company claimed foreign lines should be allowed to carry international passengers between U.S. domestic points even though these passengers arrived in or were departing from the U.S. on another carrier. The case aroused a storm of protest from U.S. domestic airlines.

Said CAB: "Under any realistic view, the . . . transportation wholly between U.S. points of what may be termed foreign transfer traffic is an internal activity, and its carriage is a normal incident of domestic operations."

Engine Conversion Loans Okayed

An important decision by the U.S. Comptroller General has approved the use of government-guaranteed loans to convert airline planes from piston engines to turboprops.

Under the 1957 Air Carrier Loan Act, CAB was to guarantee only "aircraft purchase loans." But the Comptroller General said loans could also be used for aircraft modernization and that the purpose of the Act was to "improve service and efficiency of operation." CAB requested the ruling in connection with Hawaiian Airlines' application for a loan to convert Convairs to turboprops.

Fuel Tax Boost Unlikely

The Administration requested Congress to increase aviation fuel taxes, but favorable action at this session is unlikely.

The Treasury Dept., carrying out the President's budget recommendations, asked a 2.5¢ per gallon boost on aviation gas (present tax is 2¢) and a flat 4.5¢ per gallon levy on jet kerosene fuels, now untaxed. However, Rep. Wilbur Mills (D-Ark.), chairman of the tax-writing Ways and Means Committee, has said that Congress would not support fuel tax increases this year.

British Study Supersonic Airliners

Britain should design two supersonic transports, the government's Supersonic Transport Aircraft Committee has recommended. The group, formed three years ago, is composed of airline and manufacturing representatives.

One plane should be a 150-passenger model, cruising at Mach 2, for New York-London, the committee said. The other would cruise at Mach 1.2, carrying 100 passengers over distances up to 1,500 miles.

FAA Studies Fitting Planes to Runways

Federal Aviation Agency is taking under advisement the "possibility of developing regulations which will have the effect of fitting aircraft into feasible airport development," Deputy Administrator James T. Pyle told the American Association of Airport Executives.

Pyle noted that last October maximum runway length which would be eligible for federal aid was increased from 8,400 ft. to 10,500 ft. "If we are ever to reach a point where new and larger aircraft are not always demanding more and more runway, we may some day have to give serious consideration to setting certain runway lengths past which we will not go. We may also have to set some certification standards for new aircraft which will require that they operate on runways of established and existing length."

3-Man Jet Crew for Delta

Delta Air Lines and Air Line Pilots Association signed a contract providing for a three-man crew on jets—two pilots and a pilot-trained engineer. Delta uses pilot-engineers who are members of ALPA rather than Flight Engineers International Association. The contract was in sharp contrast to agreements signed by American and Eastern covering four-man crews—three pilots and an engineer—and will result in lower jet operating costs for Delta. There were reports that United Air Lines may also conclude a three-man crew contract. UAL engineers are FEIA members but the company and the union agreed last December that jet engineers will be pilot-qualified.

AA Seeks $70 Million Financing

American Airlines directors authorized private placement of a 5% $30 million note, due 1996, and sale of $40 million 5% subordinated convertible debentures, convertible into common stock at $35 a share. Debentures will strengthen the company's equity position, president C. R. Smith said. The financing, for general corporate purposes, supplements arrangements made in 1955 for private placement of a 4% $75 million note, and in 1956 for a 4¼% $60 million note.

PAL Buys 2 DC-8s for U.S. Route

Philippine Air Lines placed a $15 million order for two Douglas DC-8s and spares for late 1960 delivery and will reopen service to Japan and the U.S. This route was suspended in 1954 because of inability to finance new flight equipment.

NEWS HIGHLIGHTS

FAA Tightens Flight Crew Rules

All flight crew members are to be in their seats with belts fastened at all times "except when the absence of one is necessary in connection with his regular duties," Federal Aviation Agency has ruled. The new regulations also warn that "regular duties" was "not intended to encompass activities related to furthering public relations or other activities not related to the operational safety of the airplane."

Said FAA: "Recent near collision and other incidents indicate that failure of flight crew members to pay constant attention to their respective duties has been a contributing factor in the development of hazardous situations and that unnecessary absences from their duty stations has prevented or delayed remedial action in emergencies."

Hazeltine Alters FAA Plans

Federal Aviation Agency's plan to transfer other activities to Indianapolis to replace its technical development center, being moved to Atlantic City, has been altered sharply as a result of negotiations by Hazeltine Corp. to lease the space occupied by TDC. The former head of TDC will join the aviation electronics manufacturer, and a large number of FAA engineers may also be employed.

Hazeltine will form a new company, Hazeltine Technical Development Center Inc., and expects to move in by July 1. W. M. McFarland will b president, and D. M. Stuart, former TDC head, will become vice president-general manager. FAA engineers—possibly 60—will join Hazeltine rather than shift to FAA's Washington or Atlantic City offices.

Florida Fares Reduced

A night coach fare reduction of 25%, three nights a week, has been put into effect by six airlines from northeast and midwest points to Florida. Fares are good between 10 p.m. and 3:59 a.m. Mondays, Tuesdays and Wednesdays. New York-Miami charge is $35.10 one-way, plus tax, which is less than bus fare. Reduction was spearheaded by National Airlines in an attempt to tap auto and bus travel markets. Northeast, Eastern, Northwest, Capital and Delta objected but filed competitive tariffs. CAB allowed the new fares to become effective.

Douglas Reports DC-8, DC-9 Plans

Douglas Aircraft Co. revealed that several weeks ago it released for production a swing-tail cargo version of the DC-8, to be powered by four Pratt & Whitney J57 turbofan engines.

The company also said three manufacturers have submitted proposals for engines for the DC-9 short-range jet transport, and selection is expected soon. A market study will be made before final go-ahead. The plane would have short-field characteristics and be a "workhorse" comparable to the DC-6, president Donald W. Douglas Jr. said.

Cherington Sees Fare Cuts, Mergers

Fare reductions and pressure for mergers were predicted for the early 1960s by Dr. Paul Cherington, Harvard University, at the World Congress of Flight in Las Vegas. Fare cuts will come as carriers, particularly smaller ones, fight to maintain high jet load factors, he said, adding that only a few lines are working to develop new markets and sales methods.

Mergers may result from inability of small lines to compete. The financial community believes "that the large ones are here to stay, there is some uncertainty as to the middle-sized carriers, and real doubt about the smaller carriers."

He called for a "systems approach" to the solving of ground handling problems—reservations, ticketing, ground transport, etc. "There are many sacred cows in this area. Some of them need to be kicked and some new and fresh ideas directed at the solution."

General Dynamics Realignment

Frank Pace Jr., president of General Dynamics Corp. since 1957, was elected chairman of the board of directors, and Earl D. Johnson, former executive vice president, was named president. Pace, former Secretary of the Army, remains chief executive officer. C. Rhoades MacBride, who joined GD last year as vice president-operations, was promoted to senior vice president-operations.

Management Changes at NEA

Thomas L. Grace has been named vice president-operations of Northeast Airlines, and Edmund O. Schroeder is the new vice president-engineering and maintenance. Grace, former president of Slick Airways and more recently executive vice president of American Airmotive Corp., Miami, succeeds A. A. Lane, who asked several months ago to be relieved of his responsibilities. Schroeder, who has been vice president-maintenance of Seaboard & Western Airlines, succeeds D. W. H. MacKinnon, resigned. Before joining S&W in 1956, Schroeder had been with United 12 years and American 11 years.

Hann, Murchison Named

Capital Airlines' two largest stockholders has been named to powerful positions on the board of directors. George R. Hann, Pittsburgh attorney who first became a director in 1928, was elected board chairman, a position that has been vacant. Hann, owner of 45,832 shares, has been chairman of the board's executive committee. Charles H. Murchison, whose holdings have increased to 80,132 shares, becomes executive committee chairman. He is Capital's general counsel as well as a director. All company officers were reelected.

Dietrich Sues Hughes

Howard Hughes and Hughes Tool Co. have been sued for damages by Noah Dietrich, former executive vice president of the tool company. Dietrich, who broke with Hughes in 1957, was long rated as the top executive in the Hughes organization and was active in TWA affairs. He claims he was promised a $1 million bonus if he would refrain from retiring in 1956 and his suit covers this and other amounts.

Charles Parker Dies

Charles A. Parker, 50, well-known executive director of National Aviation Trades Association, died in Arlington, Va., of a heart attack on Apr. 21. Parker, who was finishing his tenth year as executive director, had been in aviation since 1928.

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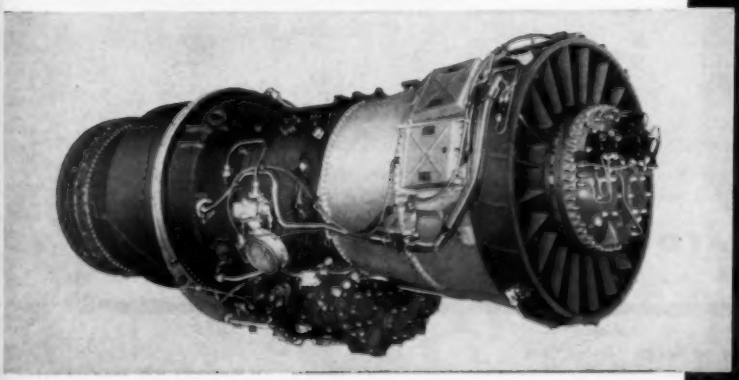

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Holley Accessory selected for Pratt & Whitney Aircraft JT-3 Engine

Three basic goals rule the efforts of design, engineering, and manufacturing engineers at Holley: exceed, if desirable, minimum performance standards, lessen the weight, and reduce the size to allow more freedom of location on the engine. Another proof of Holley's success in attaining these goals is the choice of a Holley engine accessory for the Boeing 707; the Holley designed, engineered, and manufactured compressor bleed governor. This product and other Holley jet engine accessories (like the ones shown below) demonstrate hour after hour, in the world's airways, the Holley skills developed over more than half-a-century.

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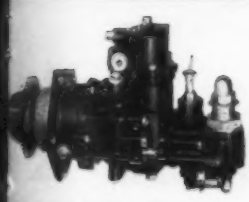
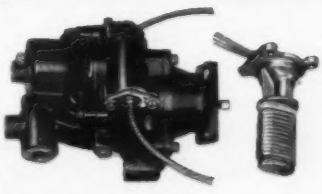
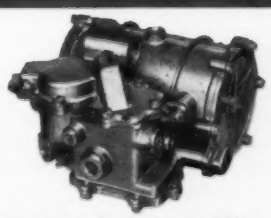


e Holley designed R-92 Com-essor Bleed Governor for the tt & Whitney Aircraft JT-3 J-57 Jet Engines.



A companion to the actuator is the R-98 Compressor Bleed Governor for the JT-4 Jet Engine.



Designed for Pratt & Whitney Aircraft JT-4 Jet Engine, the R-98 Bleed Piston Actuator is Holley designed and manufactured.

This bleed valve and actuator for the JT-3 Jet Engine is manufactured to Pratt & Whitney Aircraft design by Holley.

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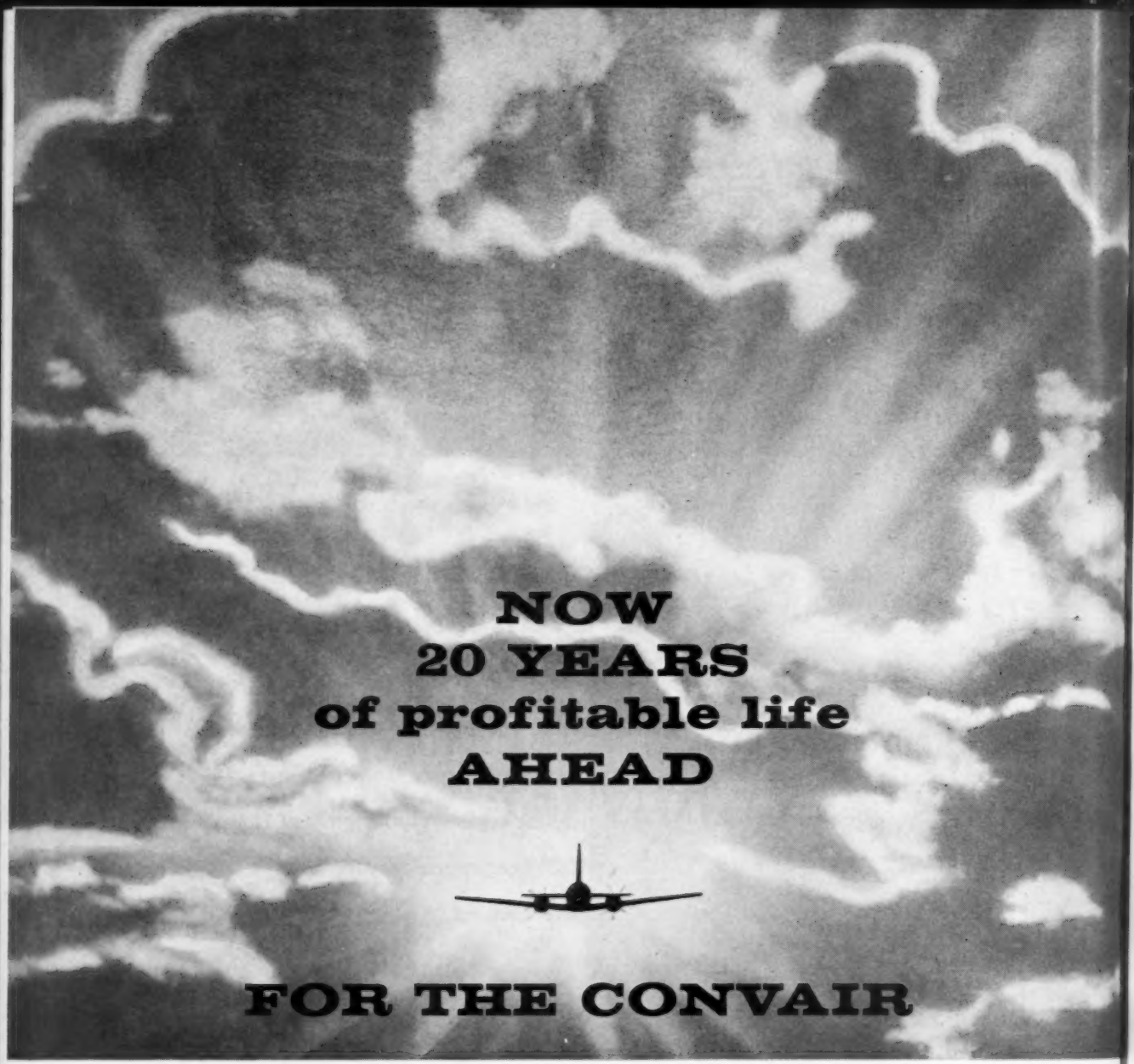

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The threat of a regulatory invasion of management.
Traffic gains pared to the bone by a business recession.
These dark clouds overshadowed air transport in 1958 as . . .

Phenomenal Jet Loads Forecast Boom

By WILLIAM V. HENZEY

Contributing Editor*

JUST WHEN it appeared the jet age was getting lost in the staggering problems of its own momentum, there appeared on the scene a champion—an inexcusably overlooked individual who should have counted from the beginning—the passenger.

When Federal decisions on dismal economic theories gained more significance than the necessity for their being in the first place; when labor strife got more attention than the technological advance which gave rise to it; when the confidence of those that invited the jet age with multi-billion dollar commitments was being visibly shaken by the pessimists; an airline started flying jets and the passenger had his say. He flew.

The result has been astonishing 90%-plus passenger load factors on the first new jets in operation. Not just the first day with souped-up inaugural flight loads. Not just the first week with the customary public response to service inaugural promotion.

For Pan American World Airways, the boom has outlasted the first half-year of transatlantic jet service. American Airlines, after two months of transcontinental service, averaged better than 95% of available seats filled. National Airlines' first five months between New York and Miami—better than 90% passenger load factors. Trans World Airlines, which started transcontinental jet service in March, reports loads at better than 94%.

Suddenly, the preliminaries are out of the way and the main event is on. The Administration's plea for higher aircraft fuel taxes, the squabble between the pilots and flight engineers, CAB's rate-of-return theories, the jet noise problem, the wailing of the railroad industry, etc., for the time being, at least, seem to have shrunk into proper perspective.

Compared to the airline industry's average passenger loads of from 55% to 65% of capacity, the sensational passenger response to the jets has lead to optimistic reappraisals of the jet age potential.

No experienced airline man today would predict that all jet services will operate day-in and day-out with 90 out of every 100 seats filled. He would be laughed out of the business if he did. Yet, facts are facts and they suffer at this point only for lack of maturity.

If jet loads continue on the phenomenal side—even 15 to 20 percentage points below those realized to date—commercial aviation is in for a boom period beyond the expectations of the most faithful optimists.

To the airlines who have, at times, met almost unbelievable resistance to their jet age efforts, the early public reaction is, to say the least, reassuring.

Yet, where 1959 and future years now loom as years of great promise, the year just past, one of the most difficult in airline history, was replete with ominous undertones. And if the paradox produces a clear message it must be that those in responsible positions either learned how not to do it or what the price of doing it wrong will be. In this framework, some of 1958's developments should be noted.

It was by far the worst labor year ever suffered by the airline industry. A total of 15 strikes occurred in an industry which averaged only three strikes a year for the previous 12 years. The man-days lost due to strikes were substantially more than the combined total in the industry for the previous 20 years.

In a year that Secretary of Labor Mitchell termed one of "comparative labor peace" for American industry generally, the ratio of airline time lost due to strikes compared to total time that could have been worked was 20½ times higher than the national average.

And from inside Government came criticism of industry for alleged failure to promote business for seats not then available for sale. One such statement wrapped it up this way: "Unless the airlines tap new markets, there are going to be some dark clouds on the jet age sunrise."

A major oversight

Somehow this criticism succeeded in reducing the whole art of promotion to the simple expedient of reducing prices. Overlooked in this promotional surgery was the jet plane itself—$5 or $6 million worth of unprecedented engineering achievement and public convenience—easily the greatest single promotional venture in airline history.

The reason for the oversight, of course, was because promotion was *not* the aim of the critics but merely appeared to provide a new arena in which to air Government opposition to fare increases at issue in the General Passenger Fare Investigation. For this reason, much more significance is attached to it than would be the case over a reasonable disagreement on methods of promoting the business.

How free CAB would be, for example, to authorize fare increases in a case pending before it after publicly asserting that airlines need to "promote" the jet age with lower fares is a question of some depth.

On top of these and countless other complicated problems for the airlines was the general business recession which cut sharply into the airlines' normal rate of traffic growth. New traffic records were again set by the industry

*Air Transport Consultant and lecturer, air transport management, Georgetown Univ.

but the relative size of the increase was well under that of previous years.

During six of the twelve months of 1958, for example, traffic on the domestic trunk airlines, as measured in revenue passenger miles, was below that for the corresponding 1957 months, an unfortunate phenomenon not experienced since the airline depression years of the late 1940s.

Yet, in the midst of all this, a barometer of airline business conditions that has often been suspect in the past, the stock market, seemed to ignore 1958's gloomy developments and advanced encouragingly. It is still going upward.

Near-sensational increases

Back in August, 1957, a month in which CAB announced it would not grant the airlines an emergency fare increase, airline stocks were at a low ebb. Those of the Big Four carriers and Pan American World Airways averaged about $20½ per share; those of the other eight domestic trunks averaged about $14½ per share.

This spring, however, the Big Four and PAA stocks averaged $10 to $12 a share higher than the 1957 figure; average of the other trunks' stock was up $8. Some showed near-sensational rises: Northwest Airlines' stock tripled, Pan American's doubled, and Delta Air Lines' jumped over $13 per share. All were up over August, 1957 prices.

The spurt has raised several questions. Why, in view of the obvious crisis facing the industry in 1958, would investor confidence be so pronounced? Or, is this an indication that the market often falsely reflects airline business conditions? Experienced stock market analysts would have their own answers.

But it appears more than coincidental that investor confidence has been asserted subsequent to the Government's heeding of airline pleas for an improved earnings position. And it could be downright prophetic that such confidence is being sustained by the phenomenal early traffic results of the jets.

The airlines have long argued that investor confidence is a necessary ingredient for the development of a sound air transport system. It was a major argument in 1957 when the companies, alarmed by disappearing profits and the effect on jet-age financing, sought an emergency fare increase of 6%. It is a major argument in the still-undecided General Passenger Fare Investigation.

CAB denied the 1957 increase request, but in January 1958, permitted the airlines to increase fares 4% plus $1 per ticket. A form of fare increase also resulted last October when the agency authorized airlines to discontinue certain discounts and reduce the Family Plan discount.

A hidden admission

What appears more significant in these developments than the amounts of the fare increase, is the impression created that the Government departed from its hard-shelled attitude on airline pricing. Although somewhat sparingly and without openly admitting it, the CAB did, by its actions, concede that management, the financial world, the Pentagon and, to some extent, the White House, were perhaps right in their appraisal of the situation.

It would appear that in asserting its confidence in airline stocks, Wall Street bought this concession more than the fact that airlines would simply realize higher revenues from higher fares.

If a regulatory commission is to shed the ancient cloak of public utility tradition and modernize its concepts and thinking to fit the technology of the industry it is regulating, maybe the full promise of the jet age will be realized after all. So Wall Street might have figured.

The early jet results would seem to bear out that low fares are not the sole answer to traffic expansion, since they are operating *not* at reduced fares, but at existing fares *plus* a surcharge.

This, of course, is not to deny the broad traffic base that can be tapped with special promotional-type and tourist fares. In this regard, actual developments are bearing out another fare-increase argument made to CAB during the past two years, namely, that a higher basic fare level permits greater flexibility for experimentation.

Recent cuts in night coach fares to and from Florida—cuts which bring air fares below those of bus lines—are illustrative. Whether such a trend might continue, however depends largely on the outcome of the major fare case which is now pending.

The industry-Government fare fight, however, important as it is, is now assuming more significance as a symbol of the strained regulatory framework under which the industry enters the jet age.

Since 1955, the trunklines, for example, have become a virtual target of the regulatory system instead of being recognized as the backbone of the industry that the system was devised not only to regulate but "foster, promote and develop."

There appear to be both political and psychological reasons for this paradox. The political seem to stem from two things. First, a Republican Administration that tried so hard to shake the "big business" tag that it swung far over on the other side in many aviation matters.

Second, the intense desire (it might be termed a "phobia" by some) of CAB to impress Democratic Congressional Committees that it is one agency not dominated by those intended to be regulated.

Two weeks at GM

The psychological reason is the distorted label of "bigness" attached to the domestic and international trunk airlines. Despite the substantial impact of the carriers' jet financing program on the economy, and their impressive growth, the role of the industry today compared to what it promises to be a decade from now is minute.

And in the blue book of big businesses today, U.S. airlines are lost. The largest U.S. air carrier estimates total revenues for 1959 which are about equivalent to two weeks of operation by General Motors. In fact, GM's annual revenues are over four times as great as the total revenues of all U.S. airlines combined.

It is doubly unfortunate that these political and psychological circumstances asserted themselves at a period of crisis for the airlines, one in which they were committed morally and financially to a giant stride forward without the "supporting crutch of subsidy," as some Government officials prefer to describe self-sufficiency.

But where one so-called "crutch" has been removed, another has been thrust forward. Where the Government knew the airlines depended on Federal aid in their formative years, it acts now as though the subsidy-free industry needs the new crutch of managerial direction.

While the establishment of boundary lines for managerial action appears to be the intended function of the Government, the exercise of managerial direction by the Government, especially where it is so susceptible to political vacillations, poses a serious threat to full realization of aviation's benefits in this country.

Thus, with passengers flocking to get on the new jets, the airlines have become a symbol of the post-recession recovery and the great economic promises of the "Sixties." Paradoxically, the industry could become a symbol also of free enterprise strangulation. It should be somewhat comforting to the airlines that the ever-important vote of the public has been cast in favor of the former symbolism, judging by the sensational response to jet travel. "Crutches" and jets just don't mix.

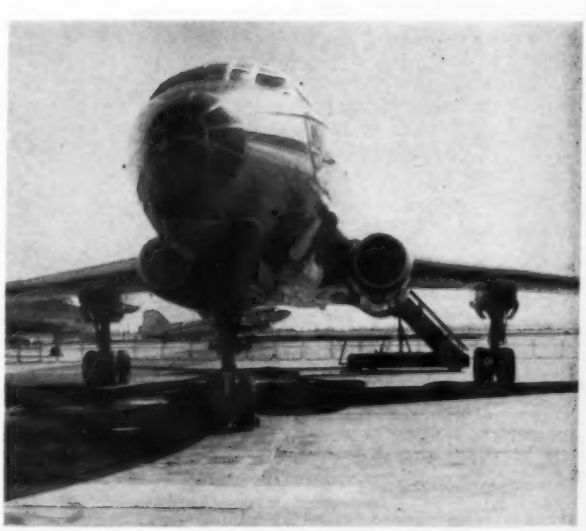
Reds Mapping Major Airline Expansion

By N. V. OCHNEV
Deputy Chief, Central Civil Aviation Administration of the USSR Council of Ministers

In this exclusive story written for AIRLIFT, Deputy Chief of Aeroflot Ochnev deals with the prospective development of Soviet aviation under the current seven-year plan. Mr. Ochnev is widely known by readers of U.S.S.R. publications as an authoritative spokesman for Russia's civil aviation. He has written numerous articles during the past three years on Soviet civil aviation plans and operations, but this is the first to be written exclusively for a Western publication.

AS A RESULT of the fulfillment of the current seven-year plan period (1959-1965), civil aviation service will be one of the major means of passenger transport in the Soviet Union. Forty thousand kilometers of new airlines will be opened during the seven-year period—an amount equal to that of the earth's circumference at the equator.

The list of new lines to be opened during the seven-year period is so long, it would take too much space to name them all. Turboprop TU-114 planes will fly from Moscow to Khabarovsk, their predecessors—the TU-104's—will fly between Moscow and Stalinabad, Baku, Yakutsk and Magadan. Airliners will also travel between Kiev and Novosibirsk, Tashkent and Sverdlovsk and Leningrad and Vladi-



Fore-runner of Russia's jet plan, twin-jet Tu-104. This was the Soviets' first civil jet transport and is flown by Aeroflot.

vostok. Seventy-five passenger IL-18's and AN-10 planes will connect Moscow and Ulan-Ude, Chita, Ust-Kamenogorsk, Ufa, Karaganda, North-Norilsk and subtropical Kutaisi, as well as the port cities of Murmansk, Arkhangelsk, Kaliningrad, Batumi and Odessa.

As more airline services are opened, the volume of freight carried in ton-kilometers also increases. Freight traffic today is considerably greater than before the war, the annual average increase in volume amounting to 20% or more.

Aeroflot (Central Civil Aviation Administration) executives are striving to reduce the rates to equal those of the railways. While previously the train fare from Moscow to Rostov-on-the-Don, for example, was practically half the flying fare, soon plane travel will cost no more than that on a fast train in a Pullman coach.

In the course of the seven-year period, existing airport facilities will be modernized in 90 cities, including Kiev, Ashkhabad, Yerevan, Stalinabad, and the Black Sea coast cities of Odessa, Sukhumi and Sochi.

Many northern cities will also be getting new airports—Arkhangelsk, Kirov, Vorkuta, Ust Kut, Magadan and Tyumen, to name but a few.

Local airlines to expand

A large number of local airlines, too, will be put into operation during the seven-year period. In Kirghizia, for example, six new routes have been opened to connect its capital with mountain districts inaccessible by ordinary transportation most of the year. This year, the first of the seven-year period, airfields will appear in practically all the district centers of the mountainous area; and in places where they cannot be built, cargo and passenger helicopters will be used.

Two helicopter routes are in operation today: Between Adler and Sochi, which began functioning on January 1, and between Simferopol and Yalta, which has been in operation since November 13. This year there will be more than 40 routes, the longest to be 420 kilometers and the shortest 15.

In remote areas of the north, where there are few good roads, helicopters will be used extensively. For instance, the Irkutsk-Koblyakovo line will serve the workers employed at the big lumber camps and saw mills as well as those of the collective fisheries. Mail, which usually takes several days and sometimes even weeks, will be received in about an hour-and-a-half.

Helicopters are no less important for Central Asia, too. There are still places in that area where even water has to be brought in by air. It's not hard to see what role the Tashkent-Angren line, which will be opened for service on July 1 of this year, will play under such conditions.

New international airlines, too, will be opened up and Moscow's Vnukovo airport will become one of the largest in the world, where travelers from 27 foreign capitals will land.

TU-114 is in the plan

The new lines will include the new 175-passenger TU-114. Its outlines and special type of chassis clearly show its kinship to the other plane designed by Academician A. N. Tupolev, the TU-104. The 114 has arrow-like wings, a cone-shaped all-glass nose, and cigar-shaped fuselage. These are the external features that distinguish it from the TU-104. They are not so numerous as those in the interior. The TU-114 has turboprop engines, the arrangement of passenger compartments is different, etc. When tested, it covered a distance of more than 34,000 kilometers in 48½ hours' flying time.

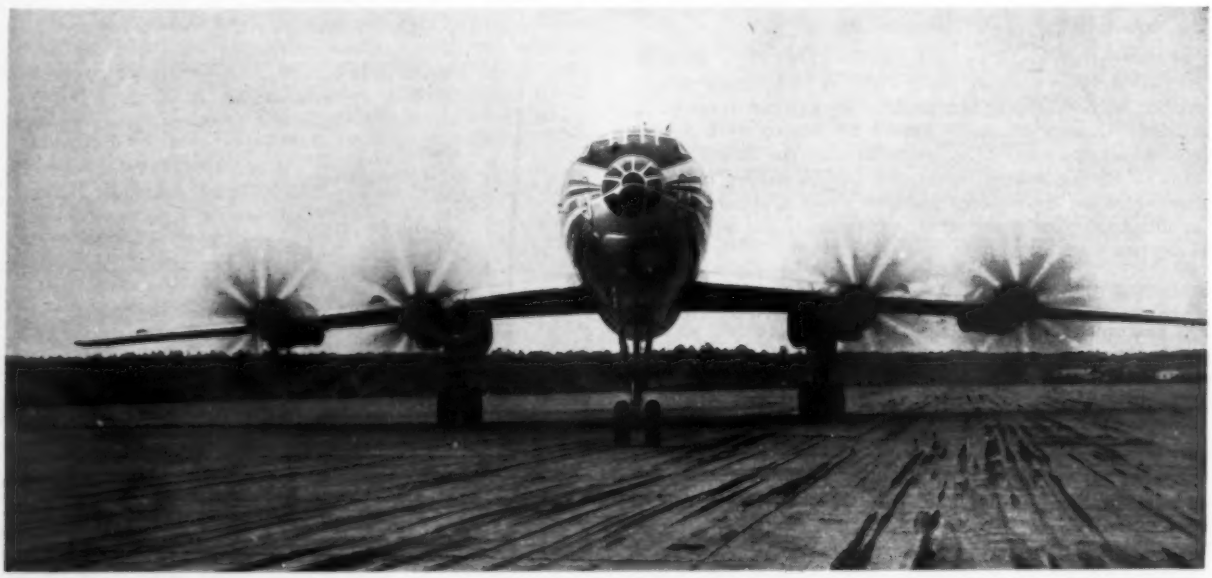
Not long ago another "relative" of the TU-104, the TU-104B, passed all tests. However, these are not the only new airliners.

Today, in designing new planes, special attention is given to economy. It has been estimated that by increasing the payload by not more than half a ton, the country will save more than 100 million rubles a year per every 100 planes.

M. L. Mil, the designer of the Mi-1 and Mi-4 helicopters, has also designed new aircraft. Helicopters by other designers will also appear on local lines, such as the Ka-15 and Yak-24.

A considerable contingent of designers is at work in the aircraft industry: Antonov, Ilyushin, Kamov, Yakovlev and others. Kuznetsov, Ivchenko and Klimov are developing new-type engines.

Radar, automation, electronic computers, semiconductors and other achievements of science and engineering will find still wider application in Soviet aviation in the coming seven-year period.



Head-on view of Russia's Tu-114, 175-passenger turboprop which figures strongly in seven-year expansion plans. This big plane, developed from a U.S.S.R. bomber, is entering civil operations at an increasingly fast rate.

AIRLIFT GUEST EDITORIAL

The Jets Outpace Industry's Economics

By PER A. NORLIN

THE MAIN PROBLEM in air transportation is and will be to offer at competitive rates the shortest possible transportation times and service in the air as well as on the ground and at the same time give shareholders such a dividend that they are satisfied and willing to continue to risk their money in a field so full of expansion and technical development.

During the past 40 years of regular air traffic, a great number of forecasts have been made, most of which have proved too pessimistic as regards aircraft, frequencies of flights and number of passengers; but with regard to financial results, unfortunately almost without exception, these have not been fulfilled.

The economics of the industry has not kept pace with its technical advances. This has been due largely to the rapid development of modern aviation, culminating in the launching of earth satellites and the entrance into the jet age. That this revolutionary expansion of air transportation will not decrease is obvious. The change from piston engines to turboprops and pure jets with reductions in flying times up to 30%-50% will accelerate the volume of the whole air traffic for many years to come.

The public wants speed above all things in air transportation. But can this be done at any price? Supersonic airplanes capable of flying 1,000 miles an hour or more are already on the manufacturers' drawing boards, and we are told that prospective buyers who can afford to finance such planes can expect delivery in eight or ten years from now. The present adjustment from piston engines to jets is neither technically or financially easy to accomplish. The sales and utilization of old equipment have been more difficult than expected.

ABOUT THE AUTHOR

Per A. Norlin is a member of the executive committee of the board of directors of Scandinavian Airlines System. He was the original founder of SAS and its predecessor, SILA, and its president from 1951 to 1955. For more than 20 years, until 1958, he was a member of the executive committee of the International Air Transport Association. Residing in Stockholm, he is active in numerous industrial concerns, but his greatest personal interest is still air transportation. His airline activities reach back 33 years.

At the same time it has turned out that the introduction and operation of jet planes requires large sums of money, and in many ways these new planes require more extensive and expensive handling than the piston engine planes. Jet flying also requires more extensive crew training than expected. The lack of modern navigational aids over many parts of the world as well as a lack of accuracy in existing aids make a widespread and expensive adjustment necessary.

Moreover, the sudden change-over to the jet age has not been followed by a similar rapid development of the ground organization, which still in many places is working according to outmoded speeds. Taking all this into consideration, it would seem to be in the common interest that the introduction of supersonic airplanes should be postponed until 1975 or later. The airlines must have time to digest the new equipment they are now receiving and will receive during the next few years.

It would also seem to be more in the interest of the public, the airlines and airplane manufacturers if the latter could be induced to concentrate their efforts in the immediate future on production of real commercial cargo planes as well as passenger planes for short and medium ranges, with vertical landings and takeoff performance, thus ending the demands for extending runways and making it possible to use small air terminals close to city centers and avoid long time-wasting ground transportation.

When such planes are constructed, and they must be easier to construct than the supersonics, the airlines will be able to reach a tremendous market which will give all concerned—public, airlines, manufacturers—a more immediate and bigger return on invested money than the production of a restricted number of very expensive supersonic airplanes. Certainly these supersonic planes are needed and will come, but every type of plane must be introduced at the right time and must be paid for. Such a development program would enable the airlines to be in a much stronger economic position when the proper time comes to order supersonics.

Speed is expensive not only in the air but also on the ground. The cost for ground facilities and all kinds of navigational aids to cut the flying time over the Atlantic from the present five-to-six hours to two-to-three hours with supersonics will be considerable. Don't forget that a supersonic

plane will need its landing clearance nearly at the same time as its departure over the Atlantic.

Big investments must be made and planned for all these facilities, and who is going to pay for them? It is no secret that the governments expect the airlines to foot the bill. There is no doubt that this cost will be so high that the burden will have such a serious effect on the companies' economy that the airlines will be well advised to be most careful in their demands for all facilities needed for this extra speed of two or three hours. Still the transportation time on the ground will be just as slow and take about the same time as the whole trip over the Atlantic.

Airplanes will soon be flying so fast that if we are not careful they will leave far behind, not only the organization which has to handle them in the air and on the ground, but also the organization which has to fill them with passengers, cargo and mail. The rate machinery for air transportation must be speeded up to be able to satisfactorily handle traffic during the jet age and during the difficult transition period in which both jet and piston engine planes will be flying.

It appears that those who are responsible for the rates have gone far too much into details. The rate structure has become so complicated that it is most difficult to understand and to control. And the lack of quick adaptability to the rapid changes in traveling habits is obvious. It is no wonder that the private charter traffic outside IATA is flourishing and seems to become more and more popular with the traveling public.

Regulation hinders competition

A more simple and flexible rate system is definitely needed to fill planes in the jet age. There must be an end to the regulation of all kinds of traffic details which today make fair and sound competition more and more difficult.

In spite of the short existence and rapid development of regular air transportation, a tendency toward bureaucracy can be noticed. It is important that these symptoms be removed as soon as possible. There will be no room for such a tendency if air traffic is to maintain the strength and flexibility which will be needed to solve all the problems involved in the introduction of the jet age.

Expensive jet equipment and its introduction seem to enforce a natural cooperation among the airlines with the aim of giving better utilization of the new equipment and cheaper maintenance and operation. As long as this cooperation can be carried on, still maintaining the nationality, independence and character of each operator, it is a sound development.

If, on the contrary, the trend turns to a complete amalgamation of the different national airlines, then we run the risk of ending up with a few gigantic air traffic companies which, no doubt, will not be in the interest of the traveling public, which wants good service, excellent connections and low rates.

How jet and supersonic speeds will be reflected in the common desire for freedom in the air remains to be seen. So far it seems as though many countries still prefer to build up their own national airlines through very restrictive traffic regulations for other companies and through a high rate policy. Most probably the jet age will very soon show which is right and which is wrong.

In all the talks about jet age and supersonics we seldom hear anybody mentioning "His Royal Highness, the Passenger," who in spite of all will finally have to pay the biggest part of what all these new developments will cost. The air traveler has become a forgotten friend who, it is taken for granted, will always accept and pay for any kind of treatment, bad or good, and be grateful for it. It is imperative that the airlines change this much-too-common attitude before the passenger wakes up and reacts.

Low Man on the Totem Pole

"His Royal Highness, the Passenger"—Per Norlin's term in the adjoining story—has become "that Low Man on the Totem Pole, John R. Smith, the average ticket holder," says outspoken Temple Fielding.

An all-out blast at the International Air Transport Association and the various classes of fares and services of the transatlantic airlines is contained in his Fielding's Travel Guide to Europe, 1959-60 edition.

The IATA "near monopoly should be broken up," he says. De luxe class service is a "fraud," economy class is third-class service with fares that are much too high.

Fielding favors breaking IATA into three smaller, self-governing groups, and wants only three fare categories: de luxe with berths only, a new "honest-to-goodness" first-class, and economy class which should be rigidly economy—third-class seating, box lunches—"austerity at far, far lower tariffs than the present IATA scale."

"Many travel professions," he writes, "seem to agree that international aviation is overdue for an industry-wide shakeup. Year after year, an important segment of the trade has become more and more alarmed about the increasingly callous concept of the carriers and their regulatory bodies toward that Low Man on the Totem Pole, John R. Smith, the average ticket holder.

"Now that traffic has suddenly skyrocketed through the skylight, there's a disquieting general trend toward what we might call 'cattle-car thinking.' Privately, too many aviation bigwigs currently talk in terms of 'push 'em on, pack 'em solid, push 'em off, and to hell with them.'

"Their attitude might be thoroughly defensible regarding economy class—*if* a rapid, frill-less passage were to be offered at a rock-bottom economy rate. But to jam vacationers into seats so miserably tiny that they'd make Greyhound bus executives throw up their hands in horror, to service up to 102 people with only two exhausted attendants, and to charge a tax-free $453.60 for a New York-London roundtrip under these conditions seems to us, at least, like legalized rapacity—especially since the same approximate mileage between New York-Los Angeles is sold every day for $228.80 including 10% tax."

Fielding puts much of the blame on IATA, which he says holds the carriers in line because of the "pathological fear of a price war in the air."

He adds: "From the public's standpoint, the first evil is the preoccupation of the airlines with so many energy-consuming side issues that, all too frequently, the tail wags the dog. They're so deeply in the travel agency business, the packaged tour business, the hotel business, and other extraneous fields that they've partially lost sight of their primary function: to transport the customer from one point to another, with maximum interest in his welfare and happiness."

Favoring a division of IATA into three smaller groups, he says he would put SAS, Swissair, KLM "and carriers which believe in offering the superior European brand of service aloft" into one group. Pan American, "keystone of the mass-traffic-at-very-low-fares school," should be in a second block, and independents should form a third.

European Pooling Concept Spreads

Europair movement dominates the scene as efforts along similar lines gain momentum in Middle East and South America

By ANTHONY VANDYK

THE DOMINANT FEATURE of the international air transport scene today is the trend toward grouping of airlines to improve their competitive situation in the jet age. European carriers have taken the lead in this group process but developments along similar lines are taking place in the Middle East and South America.

Fear that unless they work together they will be swamped by the huge fleets of jet transports now being placed in service by U.S. international carriers is undoubtedly one of the main reasons why the European airlines are seeking to get together after pursuing individualistic policies for well over a quarter of a century. The European governments, too, are showing signs of trying to work together —for the same reason. They are afraid that they will have to pick up the tab for the losses which their carriers will suffer if they attempt to meet massive U.S. jet competition on an uncoordinated basis.

Another powerful influence in bringing the European civil aviation administrations together is the fact that almost every European government is unhappy with its bilateral agreement with the U.S. (France has actually gone as far as denouncing it), feeling that in each case the European signatory has come out second best. Most of the men who shape air transport policy in the European governments freely admit that if negotiations could take place on the basis of the United States of Europe bargaining with the United States of America, the Europeans would get a much better deal than they have had in the past.

There is another country as well as the United States which is a factor in the trend toward cooperation between European carriers and governments. This is the Soviet Union, whose flag carrier, Aeroflot, poses a real threat to the U.S. international airline industry, and also to European carriers if it decides to expand its international operations without joining IATA.

However, it is the North Atlantic route which is mainly in the spotlight at the present time and it is around this route that the cooperation plans of the European carriers center.

Routes, equipment and maintenance

It is hoped that Europair will eventually result in pooled operations on all major routes, joint use of ground equipment and cooperative maintenance. However, it is unlikely that the Europair carriers will be able to achieve the coordination of aircraft overhaul that is to be accomplished by SAS and Swissair. These two carriers' cooperation is based on the use of identical equipment. The Europair group, on the other hand, has already committed itself to its turbine equipment, with only two of them buying the same model. Alitalia has ordered Conway-powered DC-8s while KLM has specified the J75 for its Douglas jets. The Boeing 707s ordered by Lufthansa will have Conways, and therefore differ from the J75-powered version being acquired by Air France and Sabena.

Where else in the world is there cooperation between airlines? In the Middle East there is increasing political pressure for the establishment of an "Air Arab" carrier which would be formed from the numerous small airlines based in the area between the Mediterranean Sea and the Indian Ocean. Many of these carriers have ambitions to extend their operations to the United States and to the Far East, but they realize that to do so on an individual basis would be suicidal.

In fact there is growing realization throughout the world that there is no future in operating a small fleet of jet transports, even if the financing of the purchase of such aircraft represents no problem. In South America, where there is a financial problem, both carriers and governments are becoming aware that cooperation is the key to survival on intercontinental routes. Certainly in Brazil, there is a definite trend toward cooperation between carriers which hitherto have resisted any idea of working with their competitors.

No results in South America

South America has also recently been the scene of meetings between IATA and non-IATA carriers to try to settle the fare war on the U.S.-South America route. No positive results have come out of these discussions so far, but the very fact that the members of the two "enemy" groups have been getting together is in itself an achievement. Discounts on published fares by both IATA and non-IATA carriers are a permanent feature of the South American scene and any official agreements reached are not likely to be honored in practice.

A similar situation prevails in the Middle East. The granting of discounts on IATA cargo traffic is becoming increasingly widespread in Central Europe. These practices are one of the main reasons why IATA's total expenditure of $1,039,021 in 1957 (the latest year for which figures are available) included $186,991 for enforcement.

The most publicized feature of IATA's activity in recent months has been connected with the establishment of jet fares. The compromise solution of a token surcharge for the North Atlantic and no surcharge for intra-European and the Europe-Asia routes represented a blow to the manufacturers of turboprop equipment. Notwithstanding the undoubted economy of the turboprop, the jet age has arrived and the salesman trying to find customers for the Britannia, Electra and Vanguard are having a hard time.

The jet age has already arrived in many of the world's major countries and by the end of this year there will be hardly an international airport on the trunk routes of the globe without some form of jet service. Early in April, BOAC introduced the Comet 4 on the London-Tokyo route and Air France and SAS have inaugurated Caravelle service between Europe and the Middle East. Operations with the French jet will be fast extended to such widely separated points as Lisbon and Moscow, London and Khartoum.

Pan American and BOAC will have the monopoly on

North Atlantic jet operations for two more months. At the end of June, Qantas will link Australia to England via the Pacific and the U.S. with Boeing 707s. In the fall it will become the first carrier to girdle the world with jets by extending the 707 operations east from London to Australia. Pan American and Aerolineas Argentinas have already linked the U.S. with South America by jet and the Argentine carrier is also using its Comets to fly the South Atlantic. Within the next year all the major European carriers will be in operations with big jets.

The ability of the Boeing 707 and the Douglas DC-8 to use several of the world's key international airports is somewhat in doubt, but the best bet is that, with reduced payloads, the big jets will get by. The Convair 880 will be used by several carriers on routes where they believe the Boeing and Douglas jets will be unsuitable. The Comet, with better airfield performance than any other four-engine jet, will come into service later this year on certain of BEA's longer routes, but most of the world's short-haul jet flying will be done by the Caravelle. The only carrier outside the Europe/Mediterranean area to order the French jet is Brazil's Varig, but chances are good that the public's demand for jet travel will bring orders from other parts of the world to Sud Aviation.

Although sales of turboprop transports seem to have come to a virtual halt and production of the Viscount and Britannia is ending, the era of the propeller-driven turbine transport is entering a new phase with the arrival on the international scene of the Electra and the forthcoming appearance of the Vanguard. Certainly, the Lockheed turboprop's introduction has marked a turning point in the history of Ansett-ANA, which for several years has suffered from the effect of its competitor, TAA, operating Viscounts. The Vanguard, although it will not go into operation with BEA and TCA until next year, looks as though it will be a highly satisfactory Viscount replacement.

In the "DC-3 replacement" field, the F-27 has come into operation on both sides of the Atlantic and has proved to be popular with passengers. However, both Fairchild and Fokker are having difficulty in getting new orders for the aircraft, while Handley Page has so far found no customers for its lower-priced Dart-Herald. This reflects the reluctance of carriers to commit themselves to "DC-3 replacement aircraft." Moreover, notwithstanding several years of hard campaigning by Napier and recent efforts by Allison, operators are showing little enthusiasm to re-equip their Convairs, Constellations and DC-7s with turboprop engines or to buy the off-the-shelf Eland-powered version of the Convair 440 from Canadair.

Price drops delay sales

The reason for the general lag in the sale of new aircraft is to some extent due to lack of finance on the part of would-be purchasers. But the main reason, at any rate as far as the smaller airlines are concerned, seems to be the tumbling price of used aircraft. Since there is no indication that the drop in used aircraft prices, which began to be noticed about 18 months ago, is coming to an end, a very large number of airlines are adopting a waiting policy.

On the other side of the coin, is the difficulty that operators are having in disposing of their surplus piston-engine equipment in the present state of the used aircraft market. This is leading some airlines to attempt to trade their aircraft in exchange for participation in carriers enjoying good traffic rights, but lacking equipment. Some of these transactions are based on trades, while others involve leases.

With used equipment becoming more readily available, more and more small airlines are expanding their route systems on a regional basis. The big carriers, however, are adopting a policy of consolidation rather than expansion for the time being, and few new routes are being opened.

French Airlines Gain Despite Recession

Traffic up 4% over 1957 as Air France carries 2.5 million passengers, Independents gain 16%.

By JEAN-MARIE RICHE

THE WORLD-WIDE recession wave did not hit the French carriers too severely in 1958. Statistics released by the French Civil Aviation Administration reveal that passengers carried during the year totaled 3,149,900, an increase of 4% on the 1957 total.

Air France leveled off with nearly 2.5 million passengers carried while the privately-owned airlines augmented their totals by 21%. A total of 77,200 tons of cargo were transported, 3% more than during the previous year. More revealing is the production in ton-miles, which was increased by 7%, totaling about 330 million ton-miles. Air France increased by 4.4%, while the privately-owned airlines increased by 16%. Load factors were definitely inferior to the very high figures of 1957: the system average was 64%, 63% for Air France and 66% for the privately-owned airlines.

Air France, the national airline, carries 78% of the passengers, 69% of the cargo and accounts for 74% of the total ton-miles flown on the French system. In 1958, Air France did well on its long-haul routes, but fared less well on its medium-haul network. Traffic in the European-Mediterranean area suffered from temporary measures (political events, foreign currency restriction).

In the immediate future, the regular appearance of the Caravelle twin-jet liner on the medium-haul routes of Air France should do much to improve the competitive position of the airline. The timetable set for the utilization of the Caravelle is as follows: from May 12, a daily roundtrip flight is to be operated on the route Paris-Rome-Milan-Athens-Istanbul. From June 15, daily roundtrip flights are scheduled between Paris and Rome and Nice and Rome. In June, also, Caravelles will appear on Paris-London and London-Nice routes. In September, they will serve Beirut and Tel Aviv; in November, Warsaw, Moscow and Lisbon and in December, Algiers.

At the end of 1959, Air France should have eight Caravelles in service and one year later, most of the 24 ordered by the airline should be in use. Air France is rightly confident in the drawing power of the Caravelle, which should be a major factor in the efforts of the airline to improve its position on its medium-haul network this year and next year.

On the long-haul network, the Intercontinental Boeing, of which the airline has 17 on order, will appear on the North Atlantic route of Air France during the first days of 1960. They will then rapidly supersede the Super Starliners and

Super Constellations presently used to serve the remote points of the world-wide network of Air France.

The other French airlines have also entered an active stage of preparation in view of the advent of the jets. CGTA-Air Algérie, a subsidiary of the French Line (Compagnie Générale Transatlantique), continues to grow very fast and reports an increase of 19% in the ton-miles carried. With nearly 400,000 passengers and 6,000 tons of cargo transported last year, this airline will be using 10 DC-4s this summer in addition to 9 other aircraft. Air Algérie is due to receive its first Caravelles—four are on order—at the beginning of next year and seems fully qualified to operate this type aircraft. Simultaneously with Air France, this airline plays a vital role in the penetration of the Sahara, often described as "the French Texas." It will be noted that Air France has specialized in the operation of heavy cargo planes (Breguet "Deux Ponts") while Air Algérie is using medium cargos (Noratlas) exclusively. Air Algérie expects to continue to use its DC-4s for a long time side by side with its Caravelles.

TAI and UAT-Aeromaritime have both selected the Douglas DC-8 and are actively engaged in preparing for the introduction of these aircraft on their routes in 1960.

Both airlines carry a major share of their activities between Metropolitan France and the countries of the newly created French Commonwealth. Obviously, the appearance of this new political structure will have consequences on the organization of the French air transport system. And the airlines may have to operate jointly under the new Commonwealth authorities, whose functions are just being defined.

Besides this unavoidable reorganization, resulting from the political developments which occurred in 1958, the structures of the French network will be influenced by the creation of Europair. While the construction of this cooperative system between the airlines of five European countries can now be considered as an almost-certainty, the contents of the agreements are not yet easy to define. The staffs of the airlines have already manifested their opposition to any measure which may lead to cuts in the labor forces. A better productivity through Europair will therefore have to be achieved by an expansion of the traffic coinciding with the utilization of the jets. It will be noted that while the French carriers will receive about 50 jet aircraft within 18 months, the other airlines of the Common Market countries will get 20 of these aircraft.

French active in Eurocontrol

The French Administration played a leading role in the creation of Eurocontrol, a vital development aiming at a much needed rationalization of the air navigation facilities to meet the requirements of the jet age. This new supranational structure, which will have its counterpart for the French Commonwealth, is coming along well but it will fall short of its object if it does not receive the fullest cooperation on the part of the military authorities. Military traffic at the altitudes flown by the jet airliners is pretty heavy in Europe and there is an impression that supranational military authorities have not given proper attention to problems of "coexistence" with civil jets.

An unprecedented effort is being made by France, this year, to improve its airports and its navigational facilities, on which expenses amounting to well over 50 million dollars are scheduled to bring the airports and the routes to the standards of the jets. This effort was almost unexpected in a year of budgetary restrictions, and both the Minister, Mr. Robert Buron, and the Secretary General for Civil Aviation, Mr. Paul Moroni, are considered as having done an outstanding job in convincing the government that this large investment was an absolute necessity.

Most of the civilian budgetary effort supporting the French aircraft industry is backing the production and the development of the Caravelle. Fifty of these aircraft are now on firm order. But a production batch of a hundred is now being launched. Sud-Aviation expects that the initial success of the aircraft on the European network by Air France and SAS will demonstrate to the turboprop-equipped airlines that they cannot hold out with propeller-driven aircraft and will lead them, as well as those airlines which have not yet made up their minds about turbine re-equipment, to buy the available Caravelle. Sud-Aviation has hopes for the South American market and has not abandoned hope for making a breakthrough on the North American continent. On April 8th, Sud-Aviation formally received the U.S. and French C of A's, giving to the Caravelle its official certification.

Besides the Caravelle, the Noratlas cargo transport is still in limited production with Nord-Aviation. Even though the production rate of this aircraft has now been reduced, it appears that it will still be built for several years for the Air Force. The aircraft is used by UAT-Aéromaritime (7), Air Algérie (3) and Arkia, the domestic airline of Israel (3). The Noratlas is also produced under license in Germany. The French and German authorities are presently discussing the joint production of 3-ton and 8-ton turboprop cargo planes.

Another promising French transport is the twin turboprop Max Holste Super-Broussard, whose piston-engined prototype has begun its test flying. Holste plans to use T-53 engines on this small 17- to 24-passenger transport, which is intended to replace aircraft in the Heron and DC-3 categories. Holste has now built more than 250 of its small "Broussard" bush transports and a turboprop version of this aircraft is also considered.

The status of two small turboprop transports built in the framework of a military program, the Dassault 415 and the "Diplomate" of Sud-Aviation, is yet uncertain. The Dassault 415 was scheduled to begin its test flying in April.

Also ready for flying status is the SE 3200 3-turbine transport helicopter of Sud-Aviation. The seating capacity of this aircraft is 28 seats. Its junior brother, the Alouette, has been extremely successful with more than 250 now in service and about as many on firm order. A development, the Super-Alouette (7 passengers), has been quietly flying for several months.

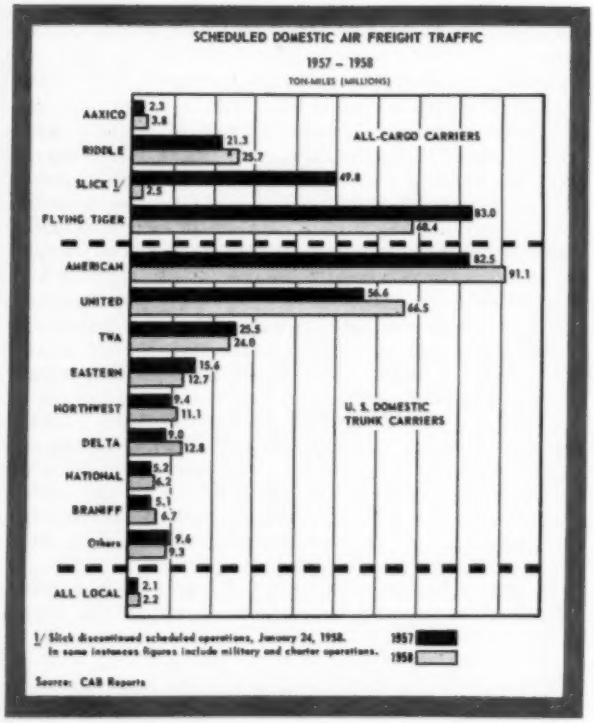
Breguet remains in the transport field with a STOL transport, the Breguet 941, a development of the experimental Breguet 940.

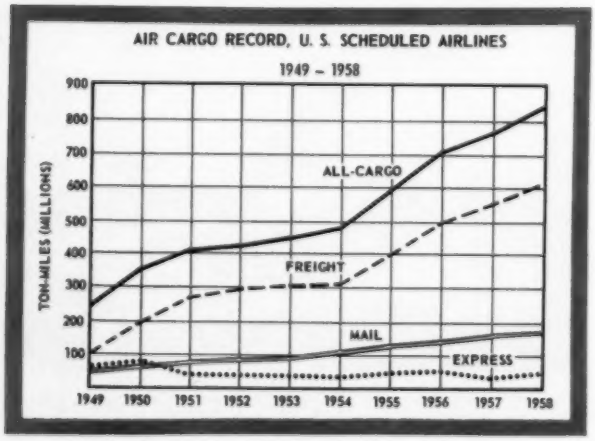
The new and old in Air France transports. Nose of Caravelle faces Super Constellation at Paris' Orly Field.

Air Cargo Gains Minimized by Strikes

Strikes Minimize Gains Although total ton-miles gain 12% over 1957, airfreight is off 4%. Mail gains 34.1-million ton miles, express 3.6 million.

By DE WITT BALLEW





THE NATION'S AIRLINES flew a total of 865,697,323 ton-miles of air cargo, including mail, express and air-freight during 1958, but strikes affecting five airlines and Slick's withdrawal from service held gains to an overall 12.9% increase over the 766,971,473 flown in 1957.

While mail and express showed gains, airfreight ton-miles dipped 10% from 552,977,656 in 1957 to 501,875,653 last year. Total cargo ton miles carried on regular scheduled flights dropped to 736,482,570 (off 4%) from 766,971,473 in 1957.

Only in air express and mail did the carriers end up on the plus side of the ledger. Air express, which suffered a dip in 1957, revived to some extent during 1958 to reach a total of 49,282,835 ton-miles. The ton-miles in this category for 1957 amounted to 46,270,000. But it was in air mail where the only sizeable increase occurred. After showing 151,121,169 ton-miles of mail hauled in 1957, the carriers reported a spurt in 1958 that boosted the total to 185,324,-080 ton-miles for the year.

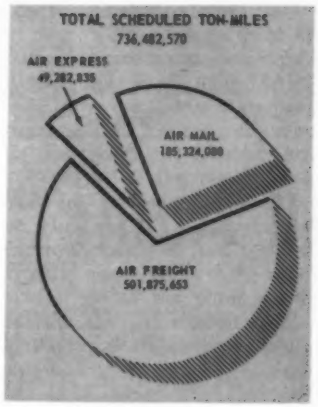
Labor troubles plagued the carriers from almost one end of the year to the other. Western Air Lines was the first to feel the effects of labor disputes and was strike-bound from February 21 to June 10. Capital found itself in a similar situation on October 15 and its planes remained grounded until November 22. Trans World Airlines was struck on November 21 and Eastern Air Lines on November 24. TWA ironed out its difficulties for the time on December 3, but Eastern remained idle until December 31. The remaining carrier to feel the effects of a strike, American Airlines, was tied up from December 19 until January 11 of 1959.

Coming at the times they did, most of the non-flying days happened just when the airlines could normally be expected to be enjoying a Christmas rush of business. During the first three months of the current year, however, air-freight business was rapidly improving and all indications are that 1957's set-backs will be overcome with a normal uptrend in business during the balance of this year.

Slick Airways' shutting down operations surprised few people in the industry. Money had been a real problem for sometime, and when the Civil Aeronautics Board ruled against the all-cargo carrier's application for subsidy it was a foregone conclusion that service on its trans-continental routes would be suspended.

Slick shortly disposed of most of its equipment and since that time has been providing airlift for the military with only a nucleus of equipment and personnel.

The gap left in the cargo-carrying field was quickly filled by other carriers, which added equipment and expanded schedules, but much of the traffic surrendered by Slick has never been recovered.



During 1958 American Airlines regained its first-place position as the nation's leading carrier of total ton-miles of domestic cargo. In 1957 AA was pushed into second place by The Flying Tigers, but during the past year American reported 121,017,189 ton-miles flown on its domestic routes. The Flying Tigers were nudged back to third position when United Air Lines rose sharply from a year earlier and hauled a total of 109,140,939 of cargo ton-miles.

In moving back, the Tigers led the all-cargo airlines with 69,348,308 ton-miles, short of the 82,986,089 ton-miles which took the lead from AA in 1957.

Second place for all-cargo carriers is held by Riddle Airlines and Seaboard & Western holds third position.

Pan American World Airways was easily the leader during 1958 on the international routes, operating 141,123,949 ton-miles, which also gives it the lead in over-all ton-miles carried. Runner up in the international competition was Northwest Airlines, which was far behind with 25,130,919 ton-miles.

Airfreight forwarders rounded out the year in much the same financial status as they reported a year earlier. Emory Air Freight, leading forwarder in 1957 from a total revenue point of view, again set the pace with $11,151,137, compared to $10,959,465 for the previous year. It also paid the largest amount of money to the airlines, having turned over some $5,600,524. Emory was followed by Airborne Freight Corp., which reported total revenues of $5,659,622 and $4,393,718 paid to the airlines.

The helicopter carriers, New York Airways, Chicago Helicopter Airways and Los Angeles Airways, reported a combined total of 83,442 ton-miles for mail, 32,905 ton-miles for air express and 6,127 ton-miles for freight.

The charts and graphs on this and the accompanying page spell out the fortunes of the various carriers during 1958.

TOP ALL-CARGO CARRIERS IN 1958

Rank	Carrier	Freight Ton Miles
1.	FLYING TIGER	104,073,462
2.	RIDDLE	67,518,321
3.	AAXICO	40,365,217
4.	SEABOARD & WESTERN	19,314,656
5.	AEROVIAS SUD	8,105,518
	Total	239,377,174

1958 Cargo Record of U.S. Airlines

Compiled by AIRLIFT from CAB records

	ALL SCHEDULED SERVICES				All Services
	Mail Ton Miles [1]	Express Ton Miles	Air Freight Ton Miles	Total Cargo Ton Miles [2]	Total Cargo Ton Miles
DOMESTIC TRUNKS					
American	20,248,963	9,607,782	91,160,444	121,017,189	121,034,316
Braniff	3,904,024	2,055,696	6,696,770	12,656,490	12,675,256
Capital	5,702,523	2,809,245	3,771,856	12,283,624	12,283,658
Continental	1,207,335	542,825	1,968,751	3,718,911	3,718,911
Delta	4,730,949	3,269,680	12,776,376	20,777,005	21,260,187
Eastern	9,985,325	4,884,716	12,669,316	27,539,357	27,541,615
National	3,848,899	720,848	6,232,905	10,802,652	10,802,652
Northeast	1,107,874	372,492	1,174,937	2,655,303	2,655,303
Northwest	5,829,278	2,828,395	11,106,632	19,764,305	19,783,163
Trans World	13,676,525	7,065,422	24,012,631	44,754,578	44,759,618
United	31,132,283	11,024,527	66,542,401	108,699,211	109,140,939
Western	2,130,166	708,053	2,396,573	5,234,792	5,234,792
Total	103,504,144	45,889,681	240,509,592	389,903,417	390,890,410
U.S. INTERNATIONAL					
American	179,408	5,211	3,215,539	3,400,158	3,400,158
Braniff	305,795	.....	1,183,241	1,489,036	1,489,036
Delta	115,362	.....	484,816	600,178	600,178
Eastern	968,870	.....	1,225,907	2,194,777	2,194,777
National	110,815	61,872	507,442	680,129	680,129
Northwest	16,417,922	327,625	8,385,372	25,130,919	26,240,356
Panagra	1,229,742	.....	5,020,442	6,250,184	6,351,565
Pan American	40,953,373	.....	100,170,576	141,123,949	142,226,157
Trans World	12,301,680	.....	7,601,259	19,902,939	23,011,058
United	1,672,800	.....	1,011,169	2,683,969	2,683,969
Western	29,305	.....	44,694	73,999	73,999
Total	74,285,072	394,708	128,850,457	203,530,237	208,951,382
LOCAL SERVICE					
Allegheny	139,042	224,634	235,361	599,703	599,435
Bonanza	64,515	31,420	93,118	189,053	189,053
Central	66,361	34,490	107,349	208,200	208,200
Frontier	230,449	100,594	671,597	1,002,640	1,003,983
Lake Central	43,291	174,266	.....	217,557	217,557
Mohawk	92,657	165,914	179,080	437,651	438,253
Northcentral	302,144	406,476)	.....	708,620	708,620
Ozark	131,418	210,327	191,455	533,200	533,200
Pacific	135,624	57,215	87,322	280,161	284,822
Piedmont	170,815	145,053	153,422	469,290	469,293
Southern	111,436	120,395	91,482	323,313	323,313
Trans Texas	176,654	101,458	331,412	609,524	609,524
West Coast	56,189	30,042	104,354	190,585	191,037
Total	1,720,595	1,802,284	2,245,952	5,768,831	5,776,290
ALL-CARGO					
Aaxico	111,695	209,374	3,777,842	4,098,911	40,686,286
ASA	.....	.....	7,625,208	7,625,208	8,105,518
Flying Tiger	473,400	480,770	68,394,138	69,348,308	105,027,632
Mackey	.....	732	23,226	23,958	23,958
Riddle	339,806	376,973	25,681,837	26,398,616	68,235,100
Seaboard & Western	1,721,963	.....	13,388,064	15,110,027	20,975,377
Slick	75,817	45,041	2,514,041	2,634,899	2,634,899
UMCA	87	.....	21,231	21,318	21,318
Total	2,722,768	1,112,890	121,425,587	125,261,245	244,434,849
ALASKAN					
Alaska	583,381	34,878	1,724,125	2,342,384	3,456,590
Cordova	49,253	.....	62,678	111,931	283,247
Ellis	24,005	.....	26,594	50,599	52,057
Northern Consolidated	301,719	.....	645,018	946,737	988,878
Pacific Northern	1,248,331	48,396	3,184,859	4,481,586	4,498,140
Reeve	350,967	.....	648,250	999,217	1,470,332
Wien	397,105	.....	517,697	914,802	2,594,393
Alaska Coastal	48,352	.....	49,543	97,895	108,620
Total	3,003,113	83,272	6,858,764	9,945,151	13,452,257
TERRITORIAL SERVICES					
CaribAir	19,913	.....	39,989	59,902	63,114
Hawaiian	58,499	.....	1,494,755	1,553,254	1,557,431
Trans Pacific	9,976	.....	91,668	101,644	101,644
Trans Caribbean	.....	.....	358,889	358,889	469,946
Total	88,388	.....	1,985,301	2,073,689	2,192,135
HELICOPTER AIRLINES					
Chicago	17,614	.....	.....		
Los Angeles	48,005	22,527	.....		
New York	17,823	10,378	6,127		
Total	83,442	32,905	6,127		

[1] Includes U.S. Domestic non-priority mail and foreign mail.
[2] Mail, express and freight.

Top Airfreight Forwarders in 1958

	Paid to Airlines	Total Revenue	Number of Shipments Received from Shippers	Consigned to Airline
Emery Air Freight	5,600,524	11,151,137	385,032	221,607
Airborne Freight Corp.	4,393,718	5,659,622	136,781	63,404
American Shippers, Inc.	2,874,383	4,077,473	455,827	72,690
Air Express Int'l	723,692	1,418,554	49,489	12,724
Shulmon	1,464,590	3,038,590	336,128	7,657
W.T.C. Air Freight	1,185,696	1,661,362	66,818	7,131
World Wide	1,185,696	1,661,362	66,818	7,131
Wings & Wheels	830,643	1,851,141	91,477	24,196
United Parcel	794,451	1,313,847	716,642	10,886
ABC Air Freight	743,767	750,993	53,065	10,994

On Capitol Hill

MATS New Strategy: Sell Airlift

By BETTY OSWALD

LOOK FOR SOMETHING NEW this year in the perennial Capitol Hill investigations of the USAF's Military Air Transport Service.

For the first time in its history, the Air Force's No. 1 target for Congressional critics will be on the offensive with a program to talk about—a sales pitch for more airlift.

MATS is again planning an expansion of its services for the coming fiscal year, but ironically, this year the subject of its burgeoning growth is less likely to be the target of Congress. Instead, the emphasis will be placed on results —What is MATS doing with its growing fleet of aircraft and mounting personnel roster?

Congress will aim its questions at three specific areas. First: What is the impact of its operation on commercial carriers? Next: Is its airlift capability adequate to meet the needs of the Army? Third: Is MATS now running efficiently and economically?

While the questions are the customary ones for which neither the proponents or opponents of MATS have ever been able to find firm answers, the hearings are likely to be different this time. MATS will try to sell its airlift and several of the aircraft manufacturers and perhaps a few of the airlines and suppliers are being counted on to support the new and affirmative approach.

What has brought the change about? MATS has usually taken what has been dished out on the theory that its so-called training operations would have to be continued and somehow the storm would be weathered. The current concept is radically different and the major difference lies first of all in personalities.

Lt. Gen. William Tunner, MATS boss, ran the biggest airlift in history—the famous Berlin Lift—some 10 years ago. He knows first hand not only the saving of time, but the more important economies in both dollars and people possible through the use of airlift.

He has taken on, as a result, what might in industry be termed a sales promotion job to explain the MATS story to leaders in both the airlines and manufacturers.

Second, for the first time, the cost of MATS operations is known. This is not because sloppy books were kept earlier, but because MATS is now being operated on an industrial funding basis. This means that MATS, as a service organization, charges its customers—Army, Navy and Air Force—at a rate sufficient to cover its direct expenses.

Result is that Air Force has decided to move all its military personnel by air. Figures now available show that the intransit pipeline has been reduced from 16 to two days. What does this mean?

It has been estimated that in fiscal 1959, MATS will transport 325,000 AF personnel with a saving of 14 days of travel per person flown. This means in effect that it has 12,630 additional personnel in productive employment. It also means that it has been able to close two primary personnel processing centers, making available an additional 1350 people for use in other AF jobs. These savings are equivalent, according to Gen. Tunner, to the authorized personnel for three heavy bomber wings. This is important in these days of reduced force levels and spending.

While watching closely the Air Force results, Navy has already started to send about 50% of its people to new duty stations by air. This figure is expected to climb sharply in fiscal 1960. Army is expected to increase the movement of its troops by air in the hope of saving both man hours and money.

In the materiel area, MATS is also tied to airlift for engines and hi-value items. The engine program started in 1955 for engines moving to and from overseas. During 1957, reports indicate AF saved $100 million on the program, at a rate of $2 million a day for every day reduced from the engine pipeline. If a surface pipeline had been maintained, AF figures that an additional 2,193 engines would have been needed to support aircraft purchased from 1955 through 1958. Engines now cost between $100,000 and $200,000 each. This means a saving of about $218 million without taking into account savings of storage space and personnel.

MATS can meet Army needs

Has MATS the capability to meet a requirement if Army and Navy follow the route pioneered by the AF? The answer—says Gen. Tunner—is a resounding Yes. Civilian aircraft augmentation will be needed. As of now, MATS has a total generation of about 65,000 hrs. a month, of which 58,000 hrs. is available to users. In terms of tons and passengers this means an approximate airlift capability of 80,000 passengers or 17,000 tons to 89 destinations serviced by MATS overseas.

Is this the whole military airlift story? Obviously, if it were all that simple, there wouldn't be the inevitable spring hearings before either or both the House and Senate.

In fiscal 1959, MATS was ordered by the Congress to spend $80 million for civilian augmentation of airlift to overseas points. It will come close to using up the fund during the fiscal year. But this is only part of the airlift story. In addition, engines and other hi-value items are moved from AF depots to a using command within continental U.S. by contract carriers. In order to assure pilots fresh fruits and vegetables, SAC is now moving perishables by air to bases.

These all add up to $300 million in business for civilian carriers. However, there are other and serious headaches. These include the question of whether MATS should be required to use civilian airlift to an even greater extent and whether MATS has the right number and kinds of planes to meet military lift requirements in wartime.

As to the second question—nobody disagrees with the fact that MATS needs to fly to keep in trim for its wartime mission. According to data supplied to House investigators —who will kick off their MATS probe about mid-May— MATS now flies 2,000 trips per month, hauls 80,000 passengers and 12,800 tons of cargo.

Is this too much? Could MATS operations be trimmed? What would be the effects of a cutback of, say, 10%? MATS high command knows the effect on the airlift available. However, it's now trying to find out what this would mean to suppliers of fuel, tires and hundreds of other items and parts which go into the support of MATS. What, too, would it do to the plane manufacturers already hurting from the shift of interest from planes to missiles? Plane manufacturers are likely to fight any further cuts in MATS operations.

The small business problem

There is another and even trickier problem, however. MATS is committed under armed services regulations to give small business a fair share of the lift business if it can qualify. Last contracts were for $7 million of which small business got about 30%. In this era of tight business, operators of the Civilian Reserve Air Fleet are unhappy. They figure since the big four-engine aircraft must be made available to MATS in wartime, MATS ought to share with them in the same kind of partnership in peacetime. Some of them are particularly disgruntled because competing companies can qualify without meeting the CRAF fleet requirements. But only Congress can solve this problem.

On the question of the adequacy of MATS airlift capability to meet wartime defense requirements including Army, Gen. Tunner believes that an augmented MATS fleet could do the job.

Funds programed for MATS operation

Fiscal year 1958 and 1959
(In thousands)

	Fiscal year 1958, operation and maintenance	Fiscal year 1959, operation and maintenance	Industrial fund
Iceland Air Defense Force	$10,043	$9,898	
Airways and Air Communications Service	37,110	39,402	
Air Photo and Charting Service	36,064	38,831	
Air Weather Service	4,604	5,615	
Air Rescue Service	941	1,428	
Subtotal	88,762	95,174	
Headquarters, MATS and subordinate units	56,718	82,189	
Airlift Service	209,475	70,488	$287,526
Gross total	354,955	247,851	287,526
Adjustments to reflect comparability between fiscal year 1958 and fiscal year 1959:			
Additions:			
Operations of Travis Air Force Base	6,400		
SAC funded in fiscal year 1958			
Operating costs of Navy aircraft paid by Navy in fiscal year 1958	13,300		
Depot maintenance not paid by MATS in fiscal year 1958	79,400		
Deductions:			
Costs initially paid with appropriated funds then reimbursed by industrial fund		[1] 29,200	
Costs initially paid by industrial fund then reimbursed with operation and maintenance funds			[2] 30,500
Net comparability, total operation and maintenance and industrial fund	454,055	218,651	257,026
In addition to the above, funds are programed for military personnel requirements as follows	384,277	410,969	

[1] Maintenance other than depot maintenance, including supplies and materials, $21,300,000; Wake Island contract, $1,300,000; administrative overhead, $6,600,000.

[2] Air Force has mission responsibility for the following: Troop carrier, $15,300,000; air evacuation, $6,200,000; special air missions, $5,800,000; MATS, cargo and passenger, $3,200,000.

Soviets Ahead of U.S. in Airlift

SOVIET MAT FORCE

	CAPACITY	KNOTS	RANGE	TYPE
TU-110	100 Pass.	445	2200	Jet
IL-18	110 Pass. 14 Tons	370	2600	Turboprop
AN-10	125 Pass. 25 Tons	350	2500	Turboprop
TU-114D	175 Pass. or 55 Tons	400	4000	Turboprop
		U. S.		
C-118	68 Pass.	232	2200	Prop
C-121	80 Pass. 9.1 Tons	249	2200	Prop
C-124	16 Tons	204	2200	Prop
C-133	25 Tons	260	3500	Turboprop

However, some of the planes are obsolete now and others will soon be. New planes are needed, particularly in the cargo area.

What kind should they be? MATS and the Air Force would like to have 10 or 12 cargo-type jets to meet the requirements of SAC. As a general in the Pentagon put it, SAC cannot afford to wait for its support. Result is that Congress is being asked for money in 1960 to buy jets to carry high priority cargo. Chances are that Congress will provide its financial blessing. But a string may be attached. The string will require that MATS underwrite the development of a turboprop cargo plane which can meet the requirements of the commercial cargo carrier for a plane which can be handled off a 5,000 ft. runway and provide economic operations of about 5¢ a ton mile maximum.

One turboprop that can meet this requirement is the Lockheed Super Hercules which should be ready—if ordered promptly—sometime in 1961. It would be powered by four Allison T-61 engines with 5,500 lbs. equivalent shaft horsepower for each engine. The engine now under development is scheduled for 1961 if AF can continue its funding on schedule.

On completion of development of the aircraft and engine, it would be type certified for civilian use. Company estimates indicate that the plane would be relatively inexpensive to build and would be substantially free from bugs because of the development of the already operational C-130A and C-130B.

About 65% of the tooling from the C-130B could be used to build the new plane, assuring relatively cheap costs. Biggest headache is availability of engines. If AF decided to drop the T-61 around which the aircraft was designed, AF would be forced to use either the Rolls Royce Tyne-11 or possibly the Pratt and Whitney T34 in an A advanced design. These last choices are not considered desirable, however, because AF prefers a U.S. engine as a means of reducing maintenance problems. The Pratt & Whitney engine would probably force changes in design because of its size.

However, AF officers say that the plane would meet not only AF requirements but the requirements of the Army since it would be able to carry 152 airborne troops or 116 paratroopers or airline seating for 104 passengers.

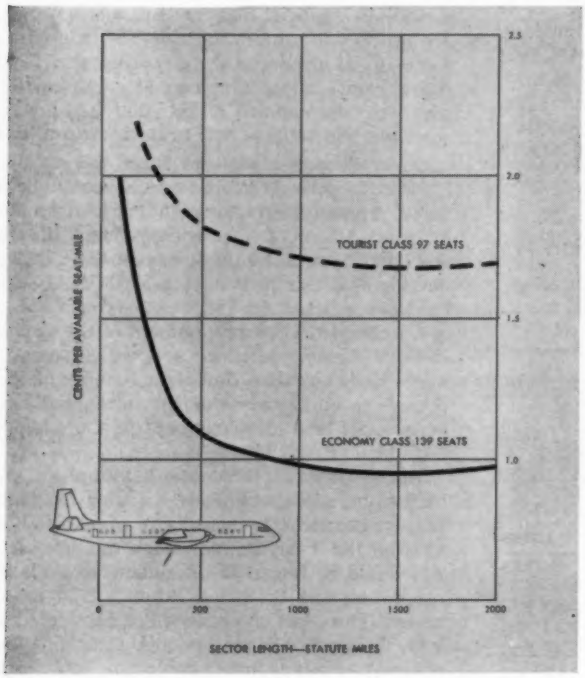
It would be capable of carrying 25 tons across the Atlantic nonstop and with pylon tanks could lift about 16 tons some 5500 miles without refueling.

MATS officers say the answers aren't available now. However, they appear confident that backed by operations of the industrial fund, they can prove the case not only for their continued operations but that their operations are efficient and are in accordance with fiats laid down by the Congress. MATS is convinced, however, that the time has come to sell airlift, both military and civilian, as an instrument of national policy.

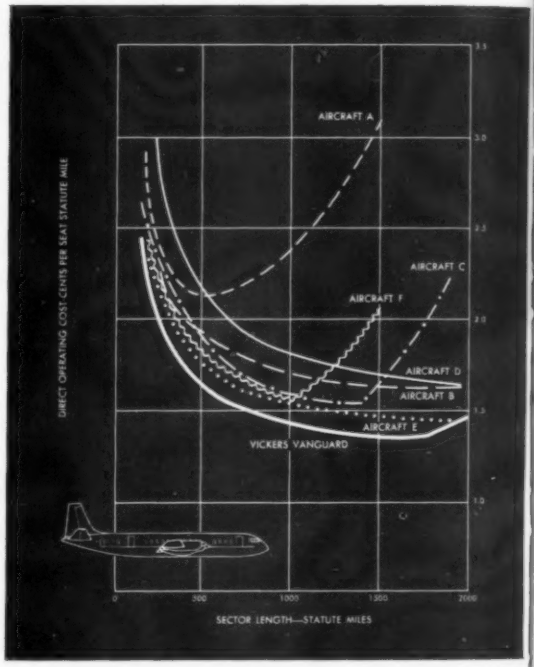
VANGUARD SEAT-MILE

Highest profit

On sectors of 900 to 2000 miles, the new jet-prop Vickers Vanguard offers seat-mile costs *under 1¢* on an economy-class configuration (139 seats). From 100 to 900 miles, costs are below 2¢ with the same configuration. The curves below, based on ATA formula costs, are representative for American carriers.



Airline study shows lowest operating costs – The following graph was prepared by one of the world's major airlines. It compares the Vanguard with five other modern airliners (all with economy configurations) and shows the Vanguard by far the most economical.



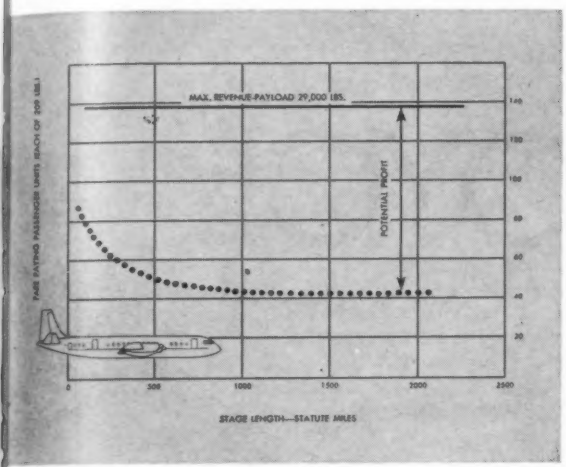
Low break-even means high profit—Because of its low operating costs and its large payload capacity, Vanguard profit potential is the best ever offered to the airline industry. On high-density routes, it will be *at least 35% higher* than that of any comparable aircraft.

The curve in the next graph plots only the passenger break-even load factor.

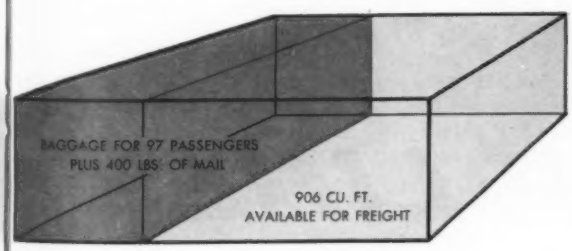
NEWEST FROM THE WORLD LEADER IN JET-PROP AIRCRAFT . . .

LE COSTS UNDER 1¢

ofit potential in airline history



Large, well-balanced passenger/freight capacity – In addition to its large comfortable passenger capacity, the Vanguard offers a *further* bonus in *freight* capacity. After accommodating all baggage for 97 passengers and 400 pounds of mail, there is still 906 cubic feet available for revenue-earning freight. The Vanguard can be operated profitably during off-peak passenger periods, thus increasing utilization and profit potential.



On some routes, Vanguard is fast as jets—or faster!

STAGE LENGTH — STATUTE MILES	THEORETICAL PURE JET GAIN OVER VANGUARD
200	6 MINUTES
400	11 MINUTES
800	22 MINUTES
1000	46 MINUTES

The chart above shows the comparative block times of the 425-mph Vanguard and a 600-mph pure jet. It is well worth noting that the Vanguard offers all its economic advantages with only the slightest sacrifice in speed on all stages up to 800 miles. In fact, on stages up to 400 miles, the Vanguard will most likely be as fast – or faster – than a pure jet in high-density, day-by-day operations. This is because of the Vanguard's outstanding operational flexibility. It can operate on low-level routing and presents no problems in meeting ATC approach patterns and stacking requirements which, in high-traffic areas, could very well dissipate the marginal speed advantages of pure jets.

And jet speed is expensive. The slight advantage of pure jets on short and medium ranges is outweighed by the wide difference in operating costs: 1¢ per seat-mile at 200 miles, 0.75¢ at 600, 0.65¢ at 1000.

If you would like detailed Vanguard specifications and a complete cost analysis based on your operations, contact Christopher Clarkson, U.S. representative, 10 Rockefeller Plaza, New York 20, New York.

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PRODUCTION REPORT

Jet Builders Press for Early Deliveries

Convair and Douglas are building up test-time at fast pace; Lockheed has delivered No. 44 Electra; Boeing rolls out 707 every three days

By RICHARD VAN OSTEN

THE U.S. jet and turboprop manufacturers are continuing to exert the big push to meet or better contract delivery schedules.

Convair's first three 880s (all basic Model 22s) have been rolled out. Nos. 1 and 3 have flown—No. 2 will remain in static test for about nine months before it too will be flown. The two aircraft currently flying probably had built up a total of about 100 hours by May 1.

No. 4 880, third aircraft targeted for the flight test program and the first 880 with a full interior, is about two to four weeks behind schedule because of difficulties with interior trim installation. The problems are expected to be solved shortly and no delay in the schedule for No. 5 is expected. Latter is TWA's first aircraft and is slated for a November delivery.

Douglas has moved 10 DC-8s out its Long Beach doors. There are 22 more in final assembly and structural work has started on No. 50. Six aircraft are presently in flight test with two more scheduled for assignment to the program. A total of more than 600 hours flight time is anticipated by May 1. Nos. 1, 3 and 4 are JT3 (J57) engined, 265,000 lb. max. gross wt., "light-weight" -6 models. No. 1 is the "house" airplane, while Nos. 3 and 4 are destined for United. Nos. 2, 5 and 6 are JT4-powered (J75) models with No. 2 (former static test aircraft) slated for United, and Nos. 5 and 6 for Pan American. Certification tests for the Convair 880 will begin in mid-June. Final ticketing is expected sometime in April or May next year. No particular delays are anticipated, but a manufacturing contingency of approximately two months has been built into the overall program. Something between 1,000 and 1,200 hours of Convair flight test time is expected to be rung up in the program, plus specific FAA test time.

Some DC-8 tests have been completed such as fuel calibration. Systems testing can be accomplished with any of the first four aircraft as they are all almost identically instrumented. The No. 4 airplane is the first with a partial interior—a typical installation rather than one for a specific carrier. The company anticipates about the same amount of time as Convair for its own phases of flight test—1,000-1,200 hours.

Little time saving expected

Both Douglas and Convair have rather mixed feelings about FAA-Boeing experience as applied to DC-8 and 880 certification programs. The thinking is that past experiences will contribute somewhat timewise, but may also mean more time because of aircraft differences. This will probably result in a net standoff—no time gained or lost.

At Burbank, Lockheed is now operating on its scheduled production peak of 9.5 aircraft per month. The 44th Electra was to have been delivered by May 1. Discounting 1958 deliveries from the total, this figure is almost 30% of Lockheed's scheduled 1959 production of 111 commercial Electras plus one Navy ASW version made up from No. 3 (static test) aircraft.

Up Washington way, Boeing is currently rolling out one aircraft about every three days, but formal scheduled peak production of eight or nine per month is not due until later this year.

The Electra—after 669 flights—was certified on Aug. 26, 1958, almost five weeks ahead of the two-year-old original schedule. Boeing's initial 707 received certification a little later than originally anticipated, but early enough to deliver six of Pan American's 707-120s by the year's end against a scheduled single aircraft.

A few problems encountered

There have been a few stumbling blocks in some programs. The Electra encountered a vibration problem under certain flight conditions that is hoped to be solved by tilting the engine nacelles upward about 3 degrees. Factory serial No. 1044, an American Airlines Electra, is currently being rushed through on a 24-hour work basis to effect the nacelle change.

Convair is making two production design changes as a result of its 880 flight tests to date. The first, a direct outcome of the flight in which a portion of the empennage was lost in an approximately Mach 0.91 dive, will provide for incorporation of main surface dampers on rudder and elevator and dampers on all flight tabs.

The second change is a relatively minor system revision to the landing gear with which some difficulty has been encountered.

Boeing's certification program also hit a couple of snags. There was also the problem of "writing the book" as FAA programs progressed. Three aircraft were essentially involved—the first three production 707-120s. It required "lots of Boeing time" and about 150 hours in actual FAA program.

One difficulty was encountered in demonstrations of high energy stops at Edwards AFB that ate up some of the time tolerances built into the program. As a Boeing spokesman puts it, "we blew lots of tires."

Heat generated during the maximum energy stops was transmitted from the wheel and brake assemblies to the tubeless tires after the aircraft had been brought to a stop and was doing nothing more than sitting on the ramp. With no other place to go, heat expanded the tire air until the tire bead separated from the sidewall.

To solve this, Boeing engineers came up with a fusible plug in the wheel. The plug is a soft metal rivet that melts out when a predetermined temperature is reached. This releases tire air—the tire will go flat, but not blow out.

LATEST CONVAIR DELIVERY SCHEDULES

(first aircraft only, not including NX deliveries)

TWA (30)	Nov. 59 (basic 880 Model 22)
DELTA (10)	Jan. '60 (Basic)
SWISSAIR-SAS (5)	Oct. '60 (Intercont. Model 30)
REAL (4)	Jan. '61 (Inter.)
TRANSCONTINENTAL (4)	Not Yet Scheduled (Inter.)
AAL (25)	Aug. '61 (600—Model 30)

LATEST LOCKHEED DELIVERY SCHEDULE

(first aircraft only)

EAL (40)	Oct. '58
AAL (35)	Dec. '58
ALLISON DIV. GMC (1)	4th quarter '58
ANSETT/ANA (2)	1st quarter '58
CATHAY-PACIFIC (2)	10 April '59
NATIONAL (23)	9 April '59
BRANIFF (9)	2nd quarter '59
WESTERN (9)	2nd quarter '59
NORTHWEST (10)	2nd quarter '59
KLM (12)	3rd quarter '59
TRANS AUSTRALIA (2)	3rd quarter '59
PACIFIC SOUTHWEST (3)	4th quarter '59
QANTAS (4)	4th quarter '59
TEAL (3)	4th quarter '59
GARUDA INDONESIAN (3)	1st quarter '60
AERONAVES (3)	1st quarter '60

162 aircraft

LATEST DOUGLAS DELIVERY SCHEDULE

(first aircraft only, not including NX deliveries)

UAL (40)	Oct. '59 (22-J57, 18-J75)	Dom.
DELTA (8)	4th quarter '59 (6 J57, 2 J75)	Dom.
PANAM (21)	4th quarter '59 (J75)	Inter.
NAL (3)	1st quarter '60 (J75)	Dom.
EAL (16)	1st quarter '60 (J75)	Dom.
KLM (8)	1st quarter '60 (J75)	Inter.
TCA (6)	1st quarter '60 (Conway)	Inter.
PANAGRA (4)	1st quarter '60 (J75)	Inter.
SAS (7)	1st quarter '60 (J75)	Inter.
ALITALIA (4)	2nd quarter '60 (Conway)	Inter.
TAI (2)	2nd quarter '60 (J75)	Inter.
UAT (2)	2nd quarter '60 (J75)	Inter.
SWISSAIR (3)	2nd quarter '60 (J75)	Inter.
JAL (4)	3rd quarter '60 (J75)	Inter.
OLYMPIC (2)	3rd quarter '60 (J75)	Inter.

LATEST BOEING DELIVERY SCHEDULE

(first aircraft only)

	Total	
PAN AMERICAN	23	Aug. 15, '58
AMERICAN	50	Oct. 23, '58
BRANIFF	5	Oct. '59
CONTINENTAL	4	May, '59
AIR FRANCE	17	Nov., '59
SABENA	5	Dec., '59
TRANS WORLD	8	Apr., '59
LUFTHANSA	4	Jan., '60
AIR-INDIA	3	Jan., '60
QANTAS	7	May, '59
BOAC	15	Dec., '59
CUBANA	2	Mar., '60
VARIG	2	July, '60
UNITED	11	Apr., '59
SOUTH AFRICAN	3	July, '60
U.S. AIR FORCE	3	Apr., '59
IRISH	3	Nov., '60
TOTALS	165	
Plus, unannounced firm orders for additional 707s	25	
TOTAL	190	

In post certification testing, Boeing is working with leading edge flaps. All the 707s have a small leading edge flap segment, but there is possibility of further developments along this line.

On its -80 prototype 707, the company has installed what is essentially the wing for the new 720 model. The wing has more sweep on the inboard section and somewhat more area. Company officials say "it is working out very well."

Boeing is still annoyed by the report that it is having difficulty in certifying the 707 under cross-wind landing conditions. Actually, the aircraft was certified for 30-knot, 90 degree crosswinds—this being the highest velocity wind Boeing could find at the time of certification. The company states also that TWA pilots in flight training have made landings in 40-knot, 90-degree winds "with plenty of control."

Convair planned to have 6 or 7 880s rolled out by May 1, including the 3 already off the line. Amount of upstream aircraft will probably remain at about 10. Production peak is not expected until June 1960 when a programmed rate of 6 per month is anticipated.

Douglas intends to hit its peak production about the same time, but it has scheduled 8 aircraft per month.

Although it is not necessarily a modification, all J75 powered DC-8s will be equipped with leading edge slots. These are optional on the J57 models, but the slots are now being installed on the No. 1 aircraft.

Spares programs are giving some concern to the manufacturers, but most have a comprehensive system for spares procurement in relation to airline needs. Main problem at present is the determination of spare percentages required.

Training programs increase

Customer training has stepped up in all areas. Convair has firmed programs for both TWA and Delta. TWA maintenance personnel will start training on a specialist basis July 13. Delta will begin its maintenance training on an overall basis in August. TWA flight instructors start training in June for a five-week course. Delta pilots will begin in October.

Douglas has put about 900 maintenance specialists through DC-8 training. Pilot training background material has been prepared and issued to customers. Flight simulator training will consist of 15 hours for each three-man crew. This will be accomplished in relation to customer first delivery date with each program beginning no earlier than 60 days prior to first delivery.

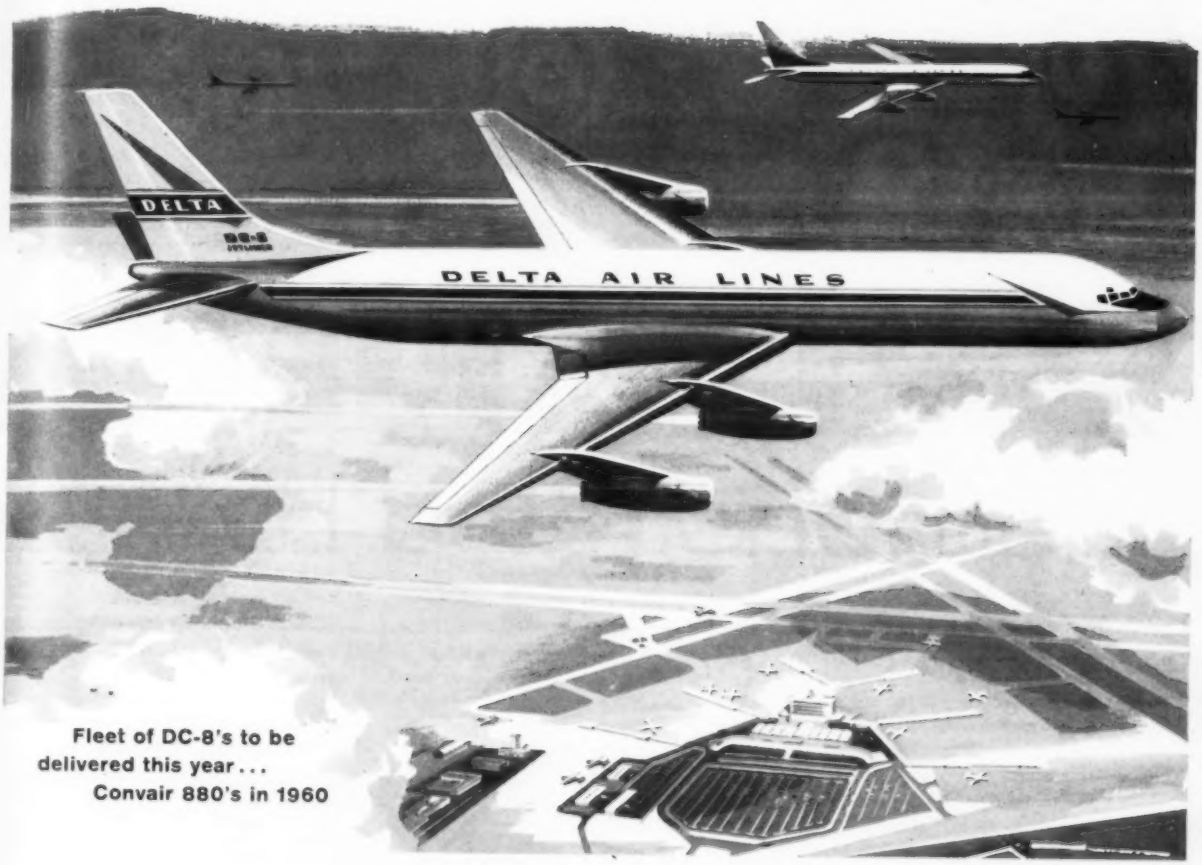
The status of options and optional models is progressing. Boeing has rolled out its first Conway-powered 707-400 for BOAC. All but one of its Intercontinental customers has gone over to the high gross weight models (311,000 lbs.). The –320 and –420 models are actually being produced in this configuration with the higher strength landing gear and extra wing fuel cells.

The outlook on Convair optional models, Model 31 –Intercontinental, and Model 30, the so-called 600, is about the same as at Boeing. Company officials say that they believe the higher gross weight, longer-range Model 31 will be taken by most customers with the exception of TWA and Delta. Douglas is also optimistic about sales of its higher gross weight models.

At its Hagerstown plant, Fairchild reports a total of 68 F-27 orders, 48 from airline customers and 20 from private corporations. Present production will run through 1959.

Recent certification of the Rda7 version has created considerable interest. Wien Alaska Airlines has taken delivery on one Rda7, and Bonanza Air Lines is flying three with six more ordered.

DELTA'S JETLINERS ARE ON THEIR WAY!



Fleet of DC-8's to be delivered this year... Convair 880's in 1960

The arrival of the Jet Age marks Delta's 30th anniversary of passenger service. With a new fleet of *true* jets (not turbo-props), Delta will bring the benefits of nearly 10-mile-a-minute service to major cities on its far-flung network of domestic and international routes. Douglas DC-8's will lead the new equipment parade and Convair 880's follow in early 1960. But no matter how fast you fly on Delta, one thing remains unhurried—the friendly courtesy and traditional hospitality that have made Delta the choice of more than 23 million passengers.

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BRITANNIA

demonstrated by new

Britannia 312's play leading part in first-ever round-the-world jet airliner service

Latest evidence of Britannia dependability and operating economy is provided by BOAC's enterprise in setting up the first-ever round-the-world jet airliner service.* This achievement by a British airline using British aircraft makes it possible to fly around the world in 3 days, 14 hours, 50 minutes—less than 87 hours, a figure expected to be reduced soon to under 80 hours.

Britannia versatility brings profit to operators

Already Britannia routes encircle the earth, service almost every major city in the world. Britannias fly over 2½ million miles a month; show unique range flexibility by covering stage lengths ranging from 300 miles inter-city to nearly 5,000 miles transpolar. They make no special demands on length and strength of existing runways.

At the same time Britannias are attracting new traffic with their quiet comfort and cruising speeds of over 400 mph—at least as high as any turboprop or piston-engined airliner in service anywhere in the world today. They prove their versatility by carrying a tremendous variety of freight loads, and bring profit to operators.

New traffic

Since introducing Britannias, El Al Israel Airlines have trebled their share of transatlantic traffic, while Canadian Pacific Airlines on their transpolar Vancouver-Amsterdam route in 1958 gained a 32% increase in westbound traffic over the same period of the preceding year.

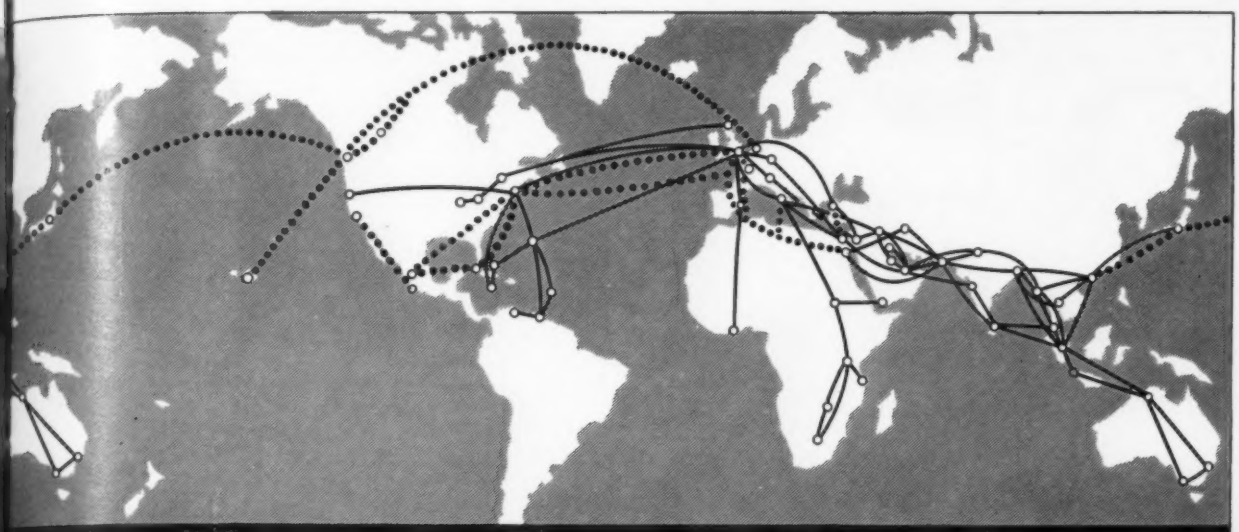
Big Charter assignments

Air Charter Ltd. Britannia flights between Christmas Island and Great Britain have been carrying no less than 128 persons—largest-ever passenger loads regularly carried across the Atlantic by a civil operator. Only 15 days after receiving their first Britannia, Air Charter had completed a full route-proving programme across the Atlantic and Pacific; the aircraft was thus earning money almost at once. Furthermore, in its first three months, it achieved an average utilisation of 7.28 hours a day.

Hunting-Clan Air Transport experience, too, has proved the Britannia unequalled at carrying large payloads at high speed over long distances. Recently a Hunting-Clan Britannia flew round the world in 65 hours flying time—a distance of 24,000 miles at an average speed of 374 mph. On the Christmas Island-London leg of the flight the aircraft was carrying 127 persons.

Engine reliability

Britannia operating economy is rooted particularly in the proven reliability of its Proteus engines. Overhaul life on the Proteus 705 series reached 2,000 hours in under 2 years. No engine of comparable power in service today

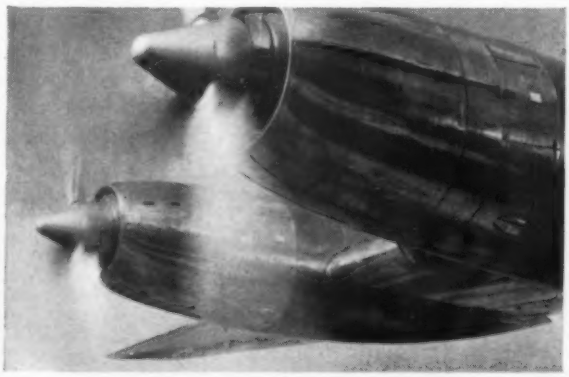


Britannia routes encircle the earth, service almost every major city in the world

BOAC, CAA, EAA, GHANA AIRWAYS———
EL AL, CPA, AERONAVES, CMA, CUBANA .....

reliability, profitability
w BOAC enterprise

has an overhaul life that even approaches this length. Annual engine overhaul costs for BOAC's Britannia 102's have been cut by 75% since the aircraft went into service. Continued development will give Proteus even longer overhaul life, entailing even lower operating costs.



Meanwhile, current versions of the engine give greater power, lower fuel consumption, and materially improve the Britannia's cruising speed, range, and take-off performance.

Finally — Britannia overall profitability is evidenced by airline experience. *El Al's Britannias are operating at a ton/mile cost approximately 20% less than any previously experienced.*

Other recent Britannia airline achievements

BOAC extend Britannia services—to Venezuela via Bermuda, Nassau; across USA to San Francisco; and via Montreal to Detroit and Chicago.

Ghana Airways—a BOAC associate—introduce Britannias on weekly London-Barcelona-Accra service on April 14.

Aeronaves de Mexico Britannia services have been slicing more than an hour off previous Mexico City-New York schedules. Now an Aeronaves de Mexico Britannia has flown Mexico City-New York in 4 hrs 57 mins (437 mph), beating own record (of 5 hrs 2 mins) made only the previous week. Load factors have been extremely high.

Cubana de Aviacion fly return journey after inaugural flight Havana-Mexico City in record-breaking 2 hrs 53 mins—shortly to set up Britannia services Havana-New York, and transatlantic via Azores to Madrid.

* Subject to governmental approval

BRISTOL
Britannia

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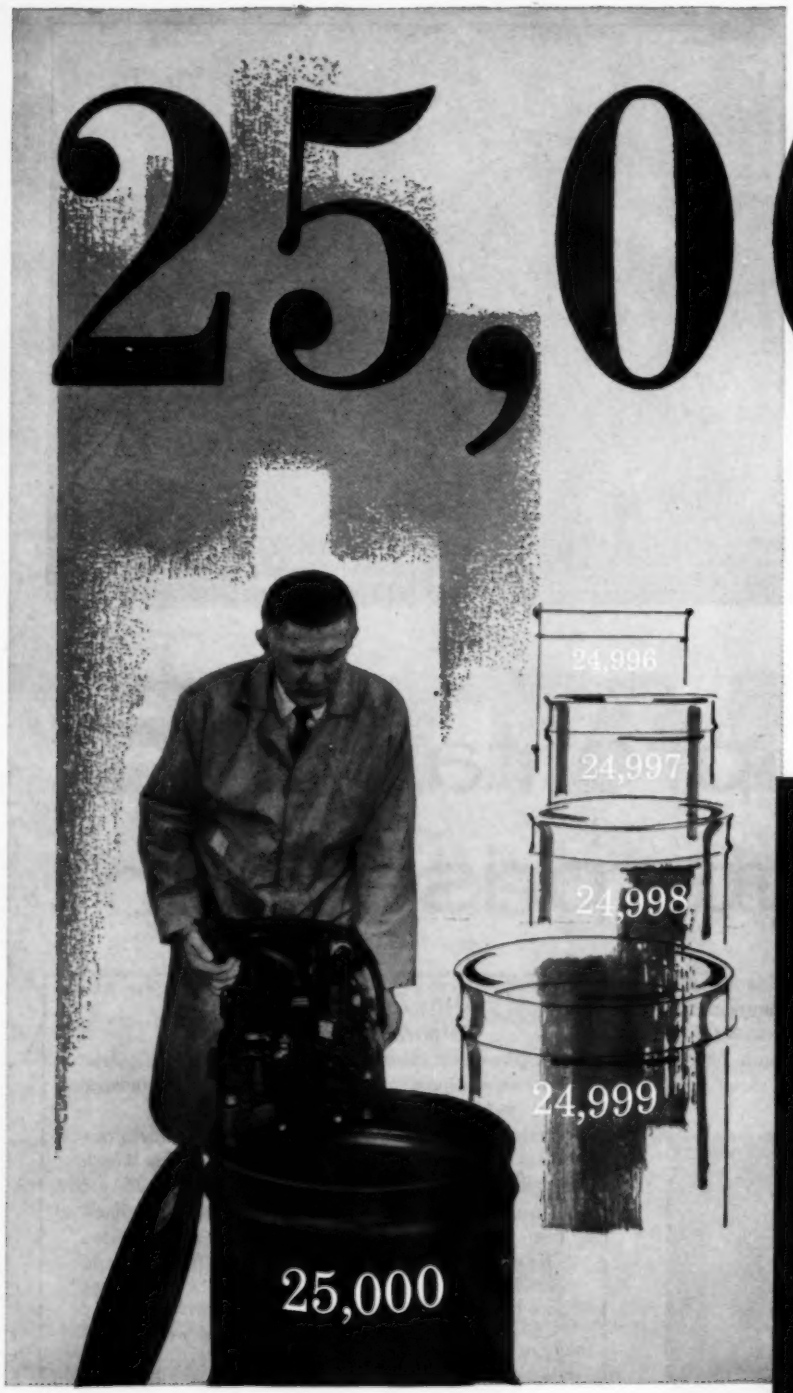

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Equipment Orders Total $1.6 Billion

U.S. airlines had on hand $1,018,117,421 worth of flight equipment at the close of 1958, and new planes and engines costing $1,645,392,095 were on order, according to an AIRLIFT analysis of CAB records.

The assets of the 48 carriers totaled $2,269,981,655 at yearend. Thus, depreciated value of flight equipment on hand was 44.8% of assets. Planes and engines ordered were 72.5% of assets.

The $1.6 billion on order *does not include* the value of jet equipment delivered before Dec. 31, 1958, nor does it include engines that will be leased rather than purchased.

Original cost of the $1,018,117,421 worth of flight equipment—planes, engines, parts, radio, etc.—was $1,967,158,515. A year earlier, at Dec. 31, 1957, the airlines had $946.7 million (depreciated) in flight equipment (original cost, $1.7 billion).

Developments since the end of December have altered the "on order" picture somewhat. For example, Eastern Air Lines has renegotiated its contract with Douglas to cover 16 DC-8s instead of 20.

Over 98% of the total new equipment orders, or $1,626,469,739, had been placed by the 12 domestic trunks plus Pan American World Airways.

	1958 Data				1957 Data		
	Original Cost —Airframes & Engines, 12-31-58	Cost—Total Flight Equipment, 12-31-58	Cost Less Depreciation—Total Flight Equipment 12-31-58	Airframes & Engines on Order 12-31-58	Cost—Airframes & Engines 12-31-57	Cost—Total Flight Equipment 12-31-57	Cost Less Depreciation—Total Flight Equipment 12-31-57
DOMESTIC & INTERNATIONAL							
American	a—164,007,273 e— 33,091,646	224,227,726	89,149,665	320,650,000[1]	a—165,465,027 e— 33,094,403	222,601,751	101,375,077
Braniff	a— 37,149,850 e— 8,664,025	53,753,158	27,067,570	49,178,390	a— 38,290,692 e— 8,865,911	55,046,875	33,211,204
Capital	a— 59,715,053 e— 14,522,780	84,130,610	58,823,930	40,198,000[2]	a— 59,500,797 e— 14,874,216	83,703,424	60,612,161
Continental	a— 26,712,532 e— 9,481,186	42,913,310	33,912,961	23,800,000	a— 13,634,333 e— 4,211,620	21,814,785	15,108,269
Delta	a— 55,313,067 e— 14,124,129	79,668,626	41,923,221	73,000,000	a— 52,291,781 e— 13,537,941	75,457,672	46,523,841
Eastern	a—188,473,799 e— 52,595,634	276,248,736	129,962,027	179,144,250[3]	a—147,671,859 e— 39,571,330	213,951,296	85,181,096
National	a— 41,582,563 e— 10,562,117	60,863,094	31,364,366	58,087,500	a— 41,474,764 e— 10,544,860	60,446,193	36,800,910
Northeast	a— 20,399,363 e— 5,501,346	29,793,427	23,321,721	2,538,200	a— 12,958,996 e— 3,469,898	19,150,561	14,687,372
Northwest	a— 63,099,376 e— 14,690,899	90,183,906	56,036,757	59,130,000	a— 49,302,663 e— 11,197,608	71,105,371	42,411,915
Panagra	a— 16,034,540 e— 4,613,345	23,592,635	10,597,408	23,340,000	a— 18,140,805 e— 4,975,895	26,346,198	13,848,564
Pan American	a—187,748,461 e— 43,415,865	276,755,185	140,838,126	222,168,127	a—162,987,728 e— 39,588,804	249,747,999	130,540,185
Trans Caribbean	a— 3,761,147 e— 390,362	5,409,219	4,845,914	none	a— 1,852,775 e— 244,050	3,744,439	257,738
Trans World	a—207,455,131 e— 50,831,807	291,403,681	130,658,209	312,579,000	a—201,379,396 e— 49,301,382	280,924,478	143,641,091
United	a—184,836,442 e— 41,568,532	259,194,492	131,731,875	242,046,272	a—166,936,453 e— 37,895,751	288,297,346	124,594,239
Western	a— 28,522,505 e— 6,696,056	38,759,630	27,156,287	20,610,000	a— 22,525,268 e— 5,606,292	31,268,978	20,601,524
Subtotal	1,595,540,831	1,836,897,435	937,399,037	1,626,469,739	1,431,393,298	1,643,607,366	869,395,186
LOCAL SERVICE							
Allegheny	a— 3,682,863 e— 109,028	4,863,076	2,535,055	168,500	a— 3,247,570 e— 71,527	4,238,504	2,259,660
Bonanza	a— 834,210 e— 399,915	1,615,080	937,308	3,787,000	a— 834,210 e— 399,915	1,279,209	791,978
Central	a— 899,413 e— 131,288	1,325,712	436,753	None	a— 824,073 e— 91,624	1,138,540	358,470
Frontier	a— 1,493,779 *e— 143,886	*2,034,139	*452,468	2,000,000	a— 1,463,844 e— 143,886	1,997,585	519,248
Lake Central	*a— 588,183 *e— 52,524	*923,483	*407,321	None	a— 564,194 e— 52,199	889,259	453,158
Mohawk	a— 4,407,138 e— 684,883	5,964,128	3,968,818	None	a— 4,469,032 e— 726,079	6,276,038	4,667,763
North Central	a— 2,916,750 e— 327,411	4,394,723	1,743,046	2,318,650	a— 2,681,517 e— 281,321	3,832,376	1,592,744
Ozark	a— 2,395,244 e— 212,711	3,409,234	1,189,244	1,770,000	a— 2,112,412 e— 34,000	2,885,827	1,168,586
Pacific	*a— 2,646,510 *e— 669,028	*3,855,191	*1,845,484	4,411,341	a— 2,711,417 e— 416,164	3,661,357	1,870,248
Piedmont	a— 5,049,613 e— 1,347,913	7,744,622	6,005,078	None	a— 1,326,370 e— 154,748	2,101,571	550,484
Southern	a— 1,150,390 e— 137,879	1,636,543	583,267	None	a— 944,490 e— 25,350	1,280,198	434,556
Trans-Texas	a— 1,485,768 e— 88,478	1,965,453	764,868	40,000	a— 1,339,765 e— 66,537	1,711,226	739,026
West Coast	a— 3,933,360 e— 1,047,121	5,873,471	4,657,056	None	a— 1,190,591 e— 92,509	1,658,246	718,437
Subtotal	36,835,286	45,604,855	25,525,766	14,495,491	26,265,344	32,949,936	16,124,358
TERRITORIAL							
Aloha (Trans Pacific)	a— 823,981 e— 64,320	1,073,390	469,437	2,545,265	a— 812,390 e— 63,945	1,034,778	518,440
Caribbean—Atlantic	a— 445,369 e— 36,193	671,001	151,235	None	a— 445,368 e— 36,192	664,565	184,648
Hawaiian	a— 4,604,031 e— 1,003,282	6,712,262	3,581,389	None	a— 3,386,500 e— 692,905	4,896,535	2,182,538
Subtotal	6,977,176	8,456,653	4,202,061	2,545,265	5,437,300	6,595,878	2,885,626
ALASKAN							
Alaska	a— 2,463,658 e— 616,248	3,741,357	2,529,737	None	a— 1,338,321 e— 348,288	2,003,499	1,206,740

[1] American will lease a number of engines for its Electra and 707 aircraft.
[2] Amount shown is for 10 Convair 880s and 15 spare GE engines for which a letter of intent has been signed but for which no definite contract has been executed.
[3] In addition Eastern has option on Electras and DC-8s totaling $90,600,000.

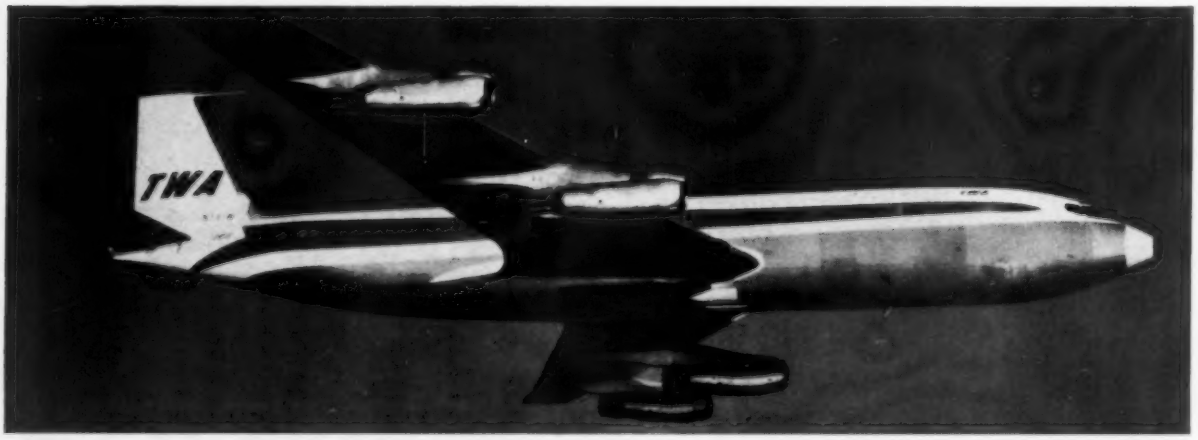
* Data as of September 30, 1958.
# Data as of June 30, 1958.
a—Aircraft.
e—Engines.

TABLE CONTINUED ON PAGE 63

IN SERVICE, the Boeing 707 has set record after record, both for performance and passenger appeal. A Los Angeles to New York passenger flight was made in 4 hours, 3 minutes. During the first 60 days of this service, the 707 averaged a load factor of more than 95%, an unprecedented high in passenger appeal.

RESERVATIONS in the thousands for flights months ahead have poured in. A noted aviation writer reports: "The tremendous public acceptance of the 707s and their great revenue-producing ability have been among the most significant commercial-aviation developments since the Second World War."

THE 707 has broken all trans-Atlantic airliner records, flying New York to Paris in 6 hours, 4 minutes, and New York to London in 5 hours, 41 minutes. 707 passenger loads to Europe have been at record levels averaging a winter load factor of 94%. In addition, 707s carried up to 5 tons of mail and cargo each flight. Boeing jets are profit-making jets. Seventeen airlines have ordered a total of 190 Boeing jetliners — a reflection of confidence in Boeing, the world's most experienced builder of multi-engine jet aircraft.



707s NOW LINK San Francisco to New York in 4 hours, 50 minutes. Here again, 707s have set new records for speed and passenger appeal. Over both transcontinental and overseas routes, 707s have demonstrated tremendous earning power, extremely high initial utilization and unprecedented public acceptance.

BOEING
Family of jet airliners

These airlines already have ordered Boeing jetliners: AIR FRANCE • AIR INDIA • AMERICAN • B.O.A.C. • BRANIFF • CONTINENTAL • CUBANA • IRISH LUFTHANSA • PAN AMERICAN • QANTAS • SABENA • SOUTH AFRICAN • TWA • UNITED • VARIG • *Also* MATS

Circle No. 30 on Reader Service Card.

	1958 Data				1957 Data		
	Original Cost—Airframes & Engines, 12-31-58	Cost—Total Flight Equipment, 12-31-58	Cost Less Depreciation—Total Flight Equipment 12-31-58	Airframes & Engines on Order 12-31-58	Cost—Airframes & Engines 12-31-57	Cost—Total Flight Equipment 12-31-57	Cost Less Depreciation—Total Flight Equipment 12-31-57
Coastal	a— 388,698 e— 99,654	533,582	232,758	None	a— 351,525 e— 86,651	502,274	201,813
Cordova	a— 440,031 e— 97,692	651,105	281,293	None	a— 457,186 e— 128,159	673,639	362,639
Ellis	a— 252,959 e— 63,524	375,556	134,612	None	a— 246,288 e— 54,234	343,520	128,438
Northern Consol.	a— 1,352,175 e— 540,551	2,136,149	1,577,531	585,000	a— 513,255 e— 144,608	830,039	110,572
Pacific Northern	a— 4,732,512 e— 1,148,938	6,869,942	4,063,592	None	a— 5,200,550 e— 1,278,780	7,305,870	4,602,911
Reeve Aleutian	a— 466,843# e— 189,691#	923,295#	393,366#	None	a— 687,409 e— 217,489	1,189,904	689,948
Wien Alaska	a— 400,731 e— 156,006	705,939	257,688	1,160,900	a— 485,595 e— 173,214	819,014	283,689
Subtotal	13,409,911	15,936,925	9,470,577	1,745,900	11,711,552	13,667,759	7,586,750
HELICOPTER							
Chicago Heli.	a— 929,529 e— 358,328	1,741,208	1,235,927	None	a— 1,116,239 e— 296,806	1,815,625	1,410,435
Los Angeles	a— 637,187 e— 100,296	1,134,638	243,857	135,700[4]	a— 632,804 e— 100,296	1,084,992	267,618
New York Airways	*a— 1,216,524 *e— 299,846	*2,064,817	*1,935,305	None	a— 1,250,788 e— 343,527	2,268,599	1,154,770
Subtotal	3,541,710	4,940,663	3,415,089	135,700	3,740,460	5,169,216	2,832,823
CARGO							
AAXICO	4,145,672	4,145,672	1,221,821	None	2,859,295	2,859,295	1,453,014
Aerovias Sud	a— 214,479 e— 101,976	348,185	279,111	None	a— 339,524 e— 57,023	446,504	316,065
Flying Tiger	a— 16,052,540 e— 6,218,368	27,310,903	19,899,486	None	a— 16,700,743 e— 6,649,473	28,222,766	22,492,306
Riddle	*a— 2,236,543 e— 377,345	*4,214,503	*2,019,242	None	a— 3,451,492 e— 498,795	6,597,917	3,775,108
Seaboard & Western	*a— 5,634,843 e— 1,978,584	11,688,301	*9,263,225	None	a— 5,032,234 e— 1,946,284	11,211,412	9,510,578
Slick	a— 5,603,629 e— 793,697	7,614,420	5,432,006	None	a— 11,558,835 e— 2,118,485	16,110,525	10,400,064
Subtotal	43,357,676	55,321,984	38,104,891	.....	51,212,183	65,448,419	47,947,135
Grand Total	1,699,662,590	1,967,158,515	1,018,117,421	1,645,392,095	1,529,760,137	1,767,438,574	946,771,878

[4] Amount is for one Sikorsky S-55. Los Angeles Airways has five Sikorsky S-61s and two Sikorsky S-62s on order but the purchase price has not yet been determined.

Speed and extra comfort on the new...

luxurious ***Super Northliner*** flights

CONVAIR

Swift, smooth, radar-equipped Convair Super-Northliners joined the Northliner fleet in daily service between key North Central route cities on April 26 : . . the latest advance in the continuing progress of North Central — America's leading local airline — first in its class in passengers, air mail and air express.

Progressive route expansions have extended North Central's system to approximately 5000 route miles — with fast, frequent, dependable service to 65 key cities, and their hundreds of adjacent communities in a nine state area.

NORTH CENTRAL AIRLINES

Serving 65 key cities in 9 states: Minnesota • Michigan • South Dakota
Iowa • Nebraska • Wisconsin • Illinois • North Dakota • Indiana

Circle No. 69 on Reader Service Card.

Selected Airline Expenditures

Company	Total Assets 1958	Total Assets 1957	Shop and Servicing Supplies 1958	Shop and Servicing Supplies 1957	Passenger Food Expenses 1958	Passenger Food Expenses 1957	Advertising 1958	Advertising 1957
AAXICO	$ 2,529,389	$ 2,157,172	.....	.....	.....	.....	$ 14,484	$ 14,282
Aéroviae Sud	791,942	1,102,538	$ 9,243	$ 7,242	.....	.....	8,679	13,464
Alaska	6,182,580	4,300,160	54,341	52,027	82,532	46,620	91,255	82,045
Alaska Coastal	1,188,252	1,042,754	16,580	17,422	.....	.....	12,877	10,525
Allegheny	4,438,659	3,846,578	67,063	61,984	17,359	23,942	119,733	147,144
Aloha (Trans Pacific)	1,317,464	1,159,927	2,868	6,673	143	1,136	50,943	29,164
American	383,994,089	272,810,208	1,950,199	1,856,034	11,288,098	9,124,686	6,668,753	6,400,023
Bonanza	3,274,224	2,182,543	13,979	13,364	20,335	11,165	163,713	100,316
Braniff	65,888,941	61,390,743	374,252	354,967	2,223,448	2,059,996	1,381,250	1,232,529
Capital	81,837,806	87,098,470	490,203	490,125	2,964,235	3,357,080	2,080,012	1,484,647
Caribbean	1,164,075	1,047,821	10,196	8,968	3,010	3,344	27,405	37,199
Central	1,948,206	1,387,943	16,408	23,954	12,433	10,072	108,266	61,370
Chicago Helicopter	1,945,885	2,121,346	24,326	15,518	.....	.....	16,310	11,538
Continental	57,105,910	27,613,923	192,944	181,414	560,646	389,486	1,065,940	279,445
Cordova	842,090	868,346	6,658	12,993	5,064	5,030	3,158	12,115
Delta	89,457,427	78,259,631	872,122	775,612	2,446,691	2,090,817	2,705,150	2,491,940
Eastern	256,460,518	217,468,157	1,680,978	1,552,031	6,426,061	6,663,216	9,482,671	6,640,118
Ellis	976,050	756,640	8,903	10,289	809	.....	15,458	15,973
Flying Tigers	32,081,057	31,995,688	114,052	159,433	482,335	661,135	193,812	238,328
Frontier[1]	2,358,642[1]	1,971,443	29,386	38,638	35,289	31,281	215,812	204,117
Hawaiian	6,016,404	4,343,031	36,195	28,477	56,270	6,811	102,707	93,495
Lake Central[1]	1,393,406	1,438,070	NA	33	NA	9,321	NA	23,525
Los Angeles	990,779	1,055,433	10,148	7,311	.....	.....	5,568	5,060
Mackey	1,952,003	2,284,074	19,427	18,156	6,981	6,193	40,768	82,645
Mohawk	7,324,633	7,993,330	101,896	87,511	56,568	61,746	96,070	83,918
National	74,798,347	59,816,613	470,468	338,383	1,511,612	1,302,515	1,968,043	2,179,225
New York Airways	3,511,825	2,622,059	15,150	13,570	.....	.....	16,070	9,244
North Central	4,914,724	4,791,148	78,457	61,638	82,697	51,165	217,019	139,853
Northeast	35,576,376	24,644,580	236,426	135,808	521,384	389,837	1,841,900	1,304,892
Northern Consolidated	3,374,534	1,625,377	10,281	12,964	18,044	18,355	53,165	30,329
Northwest	106,060,669	76,222,224	729,627	611,800	2,477,904	1,998,234	2,944,712	2,253,780
Ozark	2,988,192	2,714,679	58,080	59,626	29,827	28,201	173,620	91,538
Pacific[1]	4,066,225	4,059,236	NA	44,357	NA	9,448	NA	218,956
Pacific Northern	7,800,859	7,935,103	84,505	82,593	269,800	261,066	102,081	102,639
Pan American	358,509,333	295,505,456	994,433	1,555,181	3,727,138	6,438,952	4,884,873	8,837,053
Alaska	.....	.....	36,711	63,575	105,900	139,649	86,755	133,486
Atlantic[1]	.....	.....	NA	647,446	NA	2,598,890	NA	4,107,074
Latin American	.....	.....	475,857	310,712	2,259,472	2,222,080	2,878,210	2,770,268
Pacific	.....	.....	481,865	533,448	1,361,766	1,478,333	1,919,908	1,826,225
Panagra	27,218,751	25,476,226	59,878	36,556	346,413	384,378	1,077,122	1,001,089
Piedmont	11,197,423	3,832,684	47,688	24,076	67,767	54,345	161,358	202,066
Reeve[1]	2,053,053	1,353,168	.....	874	.....	19,972	.....	6,890
Resort	3,955,007	3,375,769	78	20	.....	17,196	.....	.....
Riddle	8,199,281	10,179,778	25,539	67,275	.....	.....	40,869	60,225
Seaboard & Western[1]	19,853,195	19,783,760	NA	62,388	NA	291,241	NA	114,189
Slick	11,528,989	17,947,113	22,613	113,165	152,723	363,690	2,517	88,888
Southern	2,110,019	983,353	53,671	38,061	18,011	15,686	106,951	96,091
Trans Caribbean	7,836,238	.....	1,441	.....	45,418	.....	70,873	.....
Trans Texas	2,599,423	2,188,841	14,489	17,283	35,436	35,366	233,525	177,548
TWA	264,285,094	253,633,248	1,883,677	1,776,632	6,782,637	6,819,420	7,080,395	7,160,627
UMCA	481	489	.....	.....	2,397	1,408	.....	176
United	332,946,821	285,906,150	2,201,455	2340,304	9,256,329	7,901,635	5,136,659	5,121,779
Western	49,595,538	44,017,076	171,198	250,041	1,325,283	1,801,176	1,238,892	1,905,074
West Coast	6,514,847	3,075,219	24,710	17,012	19,246	12,775	192,873	119,739
Wien Alaska	2,122,671	1,907,088	17,629	15,112	37,860	24,820	14,927	26,714
TOTALS	$2,275,889,146	$1,971,342,426	$ 13,383,859	13,474,895	53,418,233	$2,022,957	48,165,237	50,233,529

[1] Data for Year ending Sept. 30, 1958.

Industry's Assets Pass $2 Billion

Employment reaches 150,000 mark as annual payroll approaches $1 billion. Average wage climbs from $5,700 in 1957 to $6,056 in 1958. Food expenses increase $1.4 million

Boosted by deliveries of both turbine-powered and piston-engined aircraft, the U.S. scheduled airlines' total assets increased 15.4% in 1958 and topped the $2 billion mark for the first time, according to an AIRLIFT survey.

The survey included trunk, international, local service, all-cargo, Alaskan and territorial carriers.

Assets at the end of 1958 totaled $2,275,889,146. Topping the list was

for 1957 and 1958.

Other Promotional Publicity Expenses		Employment		Annual Payroll		Average Wage		Company
1958	1957	1958	1957	1958	1957	1958	1957	
12,799	9,956	185	173	1,617,741	1,256,837	8,745	7,259	AAXICO
985	4,496	106	64	608,990	148,872	5,745	2,326	Aerovias Sud
28,457	20,495	396	433	2,746,712	2,786,360	6,936	6,435	Alaska
821	1,110	129	134	993,769	929,184	7,704	6,832	Alaska Coastal
771	12,429	855	847	5,066,052	4,588,935	5,925	5,418	Allegheny
19,576	34,646	225	241	1,207,666	1,216,339	5,367	4,942	Aloha (Trans Pacific)
406,208	321,034	21,298	20,721	137,807,199	124,253,747	6,470	5,997	American
3,925	2,171	428	384	2,394,595	2,062,278	5,595	5,371	Bonanza
43,444	28,353	5,113	4,971	28,344,026	25,638,906	5,544	5,158	Braniff
21,047	63,942	7,445	7,981	44,912,611	42,828,839	6,033	5,366	Capital
1,696	214	265	266	1,006,679	1,012,985	3,794	3,808	Caribbean
3,704	3,089	450	435	2,511,524	2,246,329	5,581	5,164	Central
.....	418	150	122	955,303	687,667	5,702	5,637	Chicago Helicopter
14,141	9,663	1,786	1,738	11,566,938	9,912,934	6,476	5,704	Continental
15	2,171	53	65	399,332	471,514	7,535	7,254	Cordova
47,444	52,378	6,492	6,114	39,640,850	33,476,851	6,106	5,475	Delta
334,679	292,010	16,416	16,469	92,132,611	92,024,105	5,612	5,587	Eastern
442	1,389	91	97	610,309	624,066	6,706	6,434	Ellis
42,094	92,778	1,351	1,491	9,759,046	8,865,650	7,224	5,946	Flying Tigers
12,951	12,086	847	719	4,497,431	3,783,367	5,310	5,262	Frontier
35,723	23,556	596	595	3,561,348	3,607,770	5,975	6,063	Hawaiian
NA	878	408	407	2,089,498	2,075,125	5,121	5,099	Lake Central
1,784	100	118	114	656,630	652,198	5,565	5,721	Los Angeles
12,141	16,774	118	125	505,752	498,780	4,286	3,990	Mackay
5,908	6,165	721	729	4,105,148	4,074,677	5,694	5,589	Mohawk
286,764	137,991	4,405	4,500	23,600,858	22,907,172	5,358	5,090	National
4,602	606	201	190	1,328,444	1,137,891	6,609	5,898	New York Airways
22,008	24,317	1,404	1,237	7,990,047	6,464,233	5,691	5,226	North Central
15,124	44,660	2,393	2,113	14,456,350	10,935,289	6,041	5,175	Northeast
580	2,684	145	138	1,162,986	1,053,911	8,021	7,637	Northern Consolidated
99,919	105,886	6,476	5,910	41,156,373	33,701,785	6,355	5,703	Northwest
3,525	353	809	773	4,424,178	3,811,558	5,472	4,928	Ozark
NA	.....	579	476	3,126,999	2,583,233	5,401	5,427	Pacific
704	1,270	589	599	4,128,468	3,770,604	7,009	6,295	Pacific Northern
201,083	447,845	19,394	19,785	114,626,559	109,672,036	5,910	5,543	Pan American
10,071	6,169	269	282	2,141,825	2,065,314	7,962	7,324	Alaska
NA	233,842	6,897	6,667	40,815,264	36,687,456	5,918	5,503	Atlantic
93,673	83,524	7,309	8,126	39,098,304	42,003,120	5,349	5,169	Latin American
97,339	124,310	4,919	4,710	32,571,166	28,916,146	6,622	6,139	Pacific
81,556	75,167	1,341	1,347	4,542,851	4,477,696	3,388	3,324	Panagra
8,179	1,392	904	881	4,991,247	4,401,894	5,497	4,996	Piedmont
.....	1,490	.....	56	.....	433,838	.....	7,747	Reeve
.....	.....	118	107	1,213,564	1,004,880	10,284	9,391	Resort
1,941	4,835	678	840	4,710,892	4,606,752	6,948	5,484	Riddle
NA	27,259	1,073	974	6,962,403	6,023,065	6,489	6,184	Seaboard & Western
1,180	19,442	199	1,114	1,432,656	6,606,804	7,199	5,931	Slick
6,751	6,339	554	526	3,080,713	2,683,872	5,561	5,102	Southern
.....	.....	183	.....	994,892	.....	5,437	.....	Trans Caribbean
7,808	11,901	659	665	3,562,421	3,362,131	5,406	5,056	Trans Texas
284,274	278,842	18,804	17,799	112,707,517	112,254,818	5,994	6,307	TWA
.....	294	.....	.....	.....	.....	.....	.....	UMCA
325,470	266,839	20,114	20,360	130,426,383	120,102,056	6,484	5,899	United
62,876	118,311	2,585	2,808	15,786,167	15,183,645	6,107	5,407	Western
231	2,126	589	484	3,166,837	2,616,798	5,377	5,407	West Coast
1,810	5,581	235	205	2,054,608	1,578,090	8,743	7,698	Wien Alaska
2,467,140	2,597,713	150,476	149,322	911,232,173	851,097,366	6,056	5,700	TOTALS

Source: Ray & Ray

Pan American's $358.5 million, followed in order by United, American, Eastern and TWA. The last quarter of the year saw first deliveries of Boeing 707s and Lockheed Electras. PAA, Eastern and American received some of this equipment.

The rising expense trend continued last year. Significantly, employment rose less than 1%, but total payroll was up 7%, and the average wage increased 6.2% to $6,056—the first time it has exceeded $6,000. Average wages of eight domestic trunks were over $6,000—American, Capital, Continental, Delta, Northeast, Northwest, United and Western.

Payroll edged up toward $1 billion, totaling $911.2 million. Employment reached 150,476, up only .7%. Some carriers employed fewer people but paid them more. United, for example, had 246 fewer workers last year than in 1957, but its payroll was up 8.5%. Biggest employer was American, with 21,298 and pay of $137.8 million. Three other lines—United, Pan American and TWA—had payrolls exceeding $100 million.

The industry spent $56.2 million feeding its passengers, an 8.1% increase over 1957. American's food expense was $11.3 million—the first time a single carrier's bill has topped $10 million. The company carried 7.8 million passengers, and the food expenditure was about $1.45 per customer. Following American, in order, were United, TWA, PAA and Eastern.

Advertising did not show as big an increase as it has in past years. Expenditures rose 3.9% to $52.2 million. Some carriers—United, TWA and Eastern, for example—spent less than in 1957. American and PAA increased. Biggest advertiser was PAA ($8.9 million) with TWA, American, Eastern and United in the next four spots. Other promotional and publicity expenses totaled $2.9 million, a 10.8% increase.

Shop and servicing supplies cost $14.1 million, up 4.7% from 1957's $13.5 million.

WHY

RIDDLE airlines

CHOSE THE ARGOSY

More air freight is carried in the United States than in the rest of the world combined — so it is no wonder that the U.S. operators are more cost-conscious. That is one of the reasons why Riddle Airlines Inc. have placed a provisional order for the Armstrong Whitworth 650 Argosy. This major break-through in the dollar market is a tribute to the economics of this new British aircraft — the world's first pressurised turboprop freightercoach.

Mr. George L. Giles, President of Riddle Airlines, comments: "Apart from its lower direct operating cost, the Argosy will benefit the indirect expenses, due to lower handling costs . . . The AW.650 is the first aircraft to be designed and produced with this in view. With minimum reorganisation, the Argosy's quick loading and turn-round will save us at least 20 per cent on handling alone ".

The Armstrong Whitworth Argosy offers cheaper freight rates because:

1. It is 30 per cent cheaper to operate than Riddle's existing twin-engined freighters.
2. The refined loading systems available with the aircraft, together with a full-width freight door at both ends of the fuselage, give rapid turn-round and help to reduce indirect costs to a minimum.
3. The Argosy is extremely simple to service — accessibility has been built in to the design — and it can operate from semi-prepared strips.
4. An extensive service organisation for many of the components — chosen for proven reliability — already exists in most parts of the world.
5. Coast-to-coast operation in the United States is possible within 24 hours, with only one traffic stop or as many as four.

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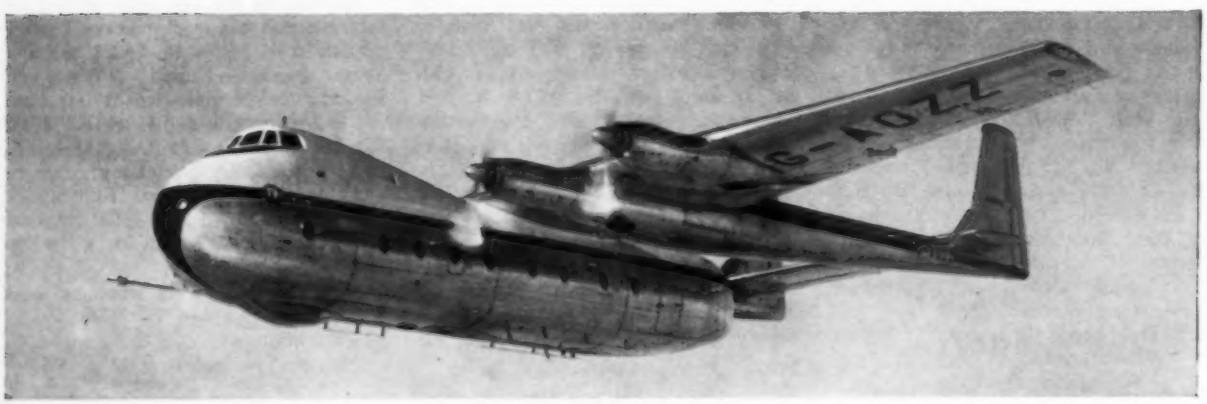

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Selected Airline Revenues and Expenditures, 1957-1958

DOMESTIC	Passenger Revenues 1958	Passenger Revenues 1957	Freight Revenues 1958	Freight Revenues 1957	Express Revenues 1958	Express Revenues 1957	U.S. Mail Revenues 1958	U.S. Mail Revenues 1957	Total Operating Revenues 1958	Total Operating Revenues 1957	Total Operating Expenses 1958	Total Operating Expenses 1957	Total Operating Income 1958	Total Operating Income 1957
American	$274,671,977	$267,181,104	$20,126,224	$17,576,060	$3,367,885	$3,193,950	$6,882,499	$6,756,823	$310,502,956	$299,915,577	$284,057,799	$282,910,420	$26,445,157	$17,005,157
Braniff	56,321,407	49,894,113	1,896,452	1,404,525	729,898	484,682	1,633,872	1,305,015	61,964,287	54,321,895	55,067,662	50,551,804	6,896,625	3,770,091
Capital	87,654,611	88,818,212	1,279,807	1,446,574	1,077,160	893,275	2,122,643	1,912,348	95,520,182	94,400,857	92,461,993	94,018,817	3,058,189	382,040
Continental	26,161,186	21,373,973	636,069	500,519	182,621	184,497	550,801	518,941	28,455,307	23,272,520	27,417,195	22,576,222	1,038,112	696,298
Delta	81,327,770	71,077,056	3,357,529	2,365,715	1,095,553	914,081	2,026,336	1,626,615	90,137,376	77,752,607	82,943,530	73,683,515	7,193,846	4,069,092
Eastern	210,649,797	228,123,264	3,487,033	3,435,772	1,777,257	1,778,161	3,655,570	4,046,502	225,157,681	243,194,284	215,188,502	235,079,124	9,969,179	8,115,160
National	53,750,815	45,727,334	1,702,691	1,354,116	262,487	224,324	1,182,637	993,880	59,529,604	50,419,473	56,489,554	48,317,965	3,040,050	2,101,508
Northeast	22,803,445	13,964,475	422,635	279,980	159,865	118,504	393,892	239,480	26,738,596	15,894,145	30,485,726	20,112,703	—3,747,130	—4,218,558
Northwest	59,982,697	48,302,053	3,164,766	2,627,208	975,166	841,553	2,035,185	1,660,330	67,581,605	54,494,314	63,827,860	54,504,644	3,753,745	—10,330
Trans World	191,675,609	178,412,619	5,768,045	5,742,961	2,434,945	2,469,571	4,648,165	4,284,309	209,608,249	196,337,491	205,179,314	201,405,971	4,428,935	—5,068,480
United	267,892,459	235,805,843	14,802,042	12,269,686	3,793,375	3,196,074	10,268,353	9,356,499	305,535,438	268,169,381	273,834,359	257,904,342	31,701,079	10,265,039
Western	30,100,645	38,492,221	707,534	867,184	284,845	368,197	716,832	1,064,036	32,518,706	41,451,128	31,170,488	36,510,640	1,348,298	4,940,488
Totals	1,362,992,418	1,287,172,267	57,350,827	49,870,300	16,141,057	14,666,869	36,116,785	33,764,778	1,513,249,987	1,419,623,672	1,418,123,902	1,377,576,167	95,126,085	42,047,505
INTERNATIONAL														
American	5,667,614	4,902,358	708,688	762,262	2,204	1,941	40,720	59,200	6,737,083	6,040,019	6,838,927	5,618,749	—101,844	421,270
Braniff	6,637,428	6,915,607	450,091	370,238	.....	.....	105,357	140,242	7,672,932	8,565,629	8,193,139	7,888,025	—520,207	677,604
Delta	5,147,713	6,056,375	139,973	181,025	.....	.....	60,883	55,502	5,601,806	6,587,081	5,531,644	5,492,189	70,162	1,094,892
Eastern	19,626,123	17,837,187	281,580	247,860	.....	.....	383,106	394,112	21,084,470	19,295,933	19,627,523	16,488,664	1,456,947	2,807,269
San Juan	13,454,846	14,517,409	228,177	226,436	.....	.....	296,000	363,879	14,551,316	15,790,329	13,645,658	13,201,816	905,658	2,588,513
Bermuda	2,430,401	1,919,927	5,909	16,068	.....	.....	18,456	13,932	2,557,498	2,052,494	1,987,129	1,473,689	570,369	578,805
Mexico	3,740,876	1,399,851	47,494	5,356	.....	.....	68,650	16,301	3,975,656	1,453,110	3,994,736	1,813,159	—19,080	—360,049
National	4,055,548	2,998,252	139,014	96,448	22,487	18,151	42,452	33,046	4,462,065	3,409,775	4,116,608	3,167,953	345,457	241,822
Northwest	21,133,203	18,372,330	3,248,441	3,008,591	48,921	60,100	7,229,704	5,926,270	34,139,304	28,938,090	27,011,856	23,944,272	7,127,448	4,993,818
Panagra	13,310,888	14,695,037	1,907,587	1,745,521	.....	.....	552,405	482,590	18,468,507	20,157,669	18,731,967	19,444,071	—263,460	713,598
Pan American	234,685,042	237,726,125	33,399,486	31,268,504	.....	.....	17,837,144	15,474,719	311,525,941	311,263,983	305,315,111	297,681,826	6,210,830	13,582,157
Latin America	66,943,025	70,263,907	13,248,380	13,559,723	.....	.....	2,284,522	3,253,795	88,797,400	93,855,849	93,346,446	95,778,674	—4,549,046	—1,922,825
Atlantic	113,482,319	106,442,317	11,525,106	9,811,626	.....	.....	8,605,232	7,478,586	142,985,391	133,156,863	136,727,868	121,160,926	6,257,523	11,995,937
Pacific	51,638,425	57,009,154	8,160,730	7,306,258	.....	.....	6,774,149	5,538,933	76,338,871	79,198,460	70,537,658	73,673,399	5,801,213	5,525,061
Alaska	2,621,273	4,010,747	465,270	590,977	.....	.....	173,241	203,405	3,404,279	5,052,811	4,703,139	7,068,827	—1,298,860	—2,016,016
Trans Caribbean	2,642,227	.....	.....	.....	72,412	.....	.....	.....	3,833,979	.....	3,936,919	.....	—102,940	.....
TWA	56,443,745	52,664,231	3,173,166	3,507,509	.....	.....	5,821,694	5,336,727	75,056,062	67,164,187	81,238,503	66,659,701	—6,182,441	504,486
United	13,336,578	12,936,200	272,103	217,405	.....	.....	548,445	426,187	14,425,842	13,777,138	12,428,566	11,730,479	1,997,276	2,046,659
Western	1,358,558	750,890	6,374	5,914	.....	.....	6,717	2,249	1,451,498	767,823	1,744,005	911,596	—292,507	—143,773
Totals	384,044,667	375,854,592	43,726,503	41,411,357	146,024	80,192	32,628,627	28,330,844	504,459,489	485,967,327	494,714,768	459,027,525	9,744,721	26,939,802
LOCAL SERVICE														
Allegheny	5,819,200	5,138,148	161,120	125,966	109,642	105,451	137,871	95,716	9,762,322	8,420,623	9,356,771	8,494,875	405,551	—74,252
Bonanza	2,707,905	1,926,764	49,508	40,113	24,231	17,085	42,161	34,091	4,746,503	3,447,927	4,674,034	3,542,743	72,469	—94,816
Central	1,824,867	1,438,360	62,775	50,351	17,912	11,305	67,593	43,473	4,870,811	3,992,737	4,693,989	4,226,752	176,822	—234,015
Frontier	4,007,726	3,419,846	275,462	269,899	41,593	28,814	114,358	110,770	7,063,119	6,430,012	7,454,550	6,541,366	—391,431	—111,354
Lake Central	2,063,194	1,568,902	.....	.....	73,492	71,857	53,730	43,737	4,010,039	3,452,097	3,868,569	3,532,826	141,470	—80,729
Mohawk	6,419,383	5,328,254	114,347	149,850	84,644	73,520	78,667	61,141	9,656,601	8,560,397	8,930,928	8,579,416	725,673	—19,019
North Central	8,672,224	7,372,333	.....	.....	164,615	146,287	252,058	220,451	12,892,731	10,572,968	12,988,225	10,726,598	—95,494	—153,630
Ozark	5,027,710	4,030,376	135,062	114,128	84,718	78,004	112,150	114,751	8,264,681	7,475,922	7,987,959	7,425,534	276,722	50,388
Pacific	4,533,419	3,889,385	43,675	40,846	37,870	34,754	128,342	116,605	7,038,034	5,990,549	7,262,904	6,044,896	—224,870	—54,347
Piedmont	6,139,404	5,293,181	83,674	86,249	67,424	50,007	113,603	101,052	9,252,858	8,326,095	8,919,152	8,187,533	333,706	138,562
Southern	2,799,424	2,262,336	55,436	1,633	44,566	48,365	100,368	100,917	5,423,622	4,427,227	5,101,954	4,565,576	321,668	—138,349
Trans Texas	3,547,454	3,297,982	144,935	130,249	40,040	43,119	120,871	117,889	7,004,604	6,712,081	6,633,867	6,539,989	370,737	172,092
West Coast	2,926,899	2,499,078	26,591	40,519	93,375	17,348	48,143	48,931	4,972,630	4,331,308	5,457,962	4,492,111	—485,332	—160,803
Totals	56,488,809	47,464,945	1,152,585	1,049,803	884,122	725,916	1,369,915	1,209,524	94,958,555	82,139,943	93,330,864	82,900,215	1,627,691	—760,272
HELICOPTERS														
Chi. Helicopter	619,907	272,327	.....	.....	6,911	.....	45,461	68,128	1,892,347	1,382,195	1,951,684	1,429,750	—59,337	—47,555
Los Angeles	182,559	178,179	.....	.....	81,278	80,440	138,329	118,737	1,339,066	1,330,302	1,216,062	1,179,330	123,004	150,972
N.Y. Airways	656,859	517,820	31,150	36,401	20,450	20,812	45,989	50,115	3,058,582	2,320,143	2,795,177	2,555,502	263,405	—235,359
Totals	1,459,325	968,326	31,150	36,401	108,639	101,252	214,779	236,980	6,289,995	5,032,640	5,962,923	5,164,582	327,072	—131,942
TERRITORIAL														
Caribair	2,033,758	1,799,649	66,476	61,288	.....	.....	27,178	25,375	2,233,732	1,972,668	2,014,074	1,759,220	219,658	213,448
Hawaiian	4,969,871	4,787,969	701,568	694,578	.....	.....	46,697	40,606	6,979,469	5,924,427	6,817,768	5,618,493	161,701	305,936
Trans Pacific	2,093,996	2,187,833	74,463	87,358	.....	.....	7,822	11,878	2,414,463	2,436,172	2,439,130	2,463,220	—24,667	—27,048
Totals	9,097,625	8,775,451	842,507	843,224	.....	.....	81,697	77,859	11,627,664	10,333,269	11,270,972	9,840,933	356,692	492,336

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WORLD'S MOST EXPERIENCED AIRLINE

Over The North Atlantic: Foreign Carriers

Big gains by foreign flag lines, introduction of economy service, and the transportation by air—for the first time—of more passengers than by steamship were the major developments on the Atlantic in 1958.

The two U.S. passenger carriers and 14 foreign flag lines flew 1,190,860 first-class, economy and tourist passengers on regular schedules from the U.S. and Canada to Europe, a substantial 23% increase over 1957's 968,146.

In addition, charter passengers showed a 95% jump to 98,953, making a grand total of 1,289,813 against 1957's 1,021,946.

The 23% gain in scheduled traffic compares with a 23.5% increase in 1957 over 1956, 20.2% in 1956 over 1955, 18.6% 1955-54, 8.6% 1954-53, 17.6% 1953-52, and 30.9% 1952-51.

Compared with the air totals, steamships carried about 970,000 Atlantic passengers last year. In 1957, air was 99.2% of steamship, and only 82% in 1956.

Almost two-thirds—63.2%—of scheduled air passengers last year traveled on foreign flag lines. Excluding Canada-Europe (not served by U.S. lines) and counting only U.S.-Europe traffic, the foreign lines carried 58.5%. It was by far their biggest year on the Atlantic. Two new lines appeared on the route during 1958—Qantas Empire Airways in January, Irish Air Lines in late April.

The foreign lines upped their available seats 48% and their passenger totals jumped 35.3% (including Canadian traffic). In contrast, Pan American World Airways flew 7.4% more passengers and offered 12.8% more seats than in 1957. TWA's business rose 4.4% and its capacity 20.7%.

In 1954, the foreign lines had 53.6% of the total market, then slipped to 51.8% in 1955. The next year, their penetration climbed to 53.7%, then to 57.4% in 1957, and took the big jump to 63.2% last year.

With available transatlantic seats increasing 34% to 1,946,183 and passengers gaining 23%, load factor fell from 66.75% in 1957 to 61.19%. Load factors by classes of service were: economy, 63.25%; tourist, 60.99%; first-class, 56.63%.

Economy class—despite the fact that it wasn't introduced until Apr. 1—got the lion's share of the business. The low-fare flights carried 55.4% of all passengers, or 660,274. Tourist class, formerly the big drawing card, got 23.1%, first-class 21.5% (counting only U.S.-Europe, the division was 54.5%, 22.8% and 22.7%, respectively). Of total seats offered, 53.6% were economy, 23.2% tourist and 23.2% first-class. The airlines, incidentally, increased their first-class seats last year by 20.3%, the biggest jump in several years. First-class traffic gained 11.7% to 255,690; tourist dropped 62.8% to 274,896.

The airlines operated 28,943 flights, up 21.7%. Of the flights, 22,653 were mixed (carrying more than one class of traffic), 2,431 first-class, 363 tourist, 3,496 economy.

Cargo showed a steady growth, totaling 26,286.5 tons, up 18.7%—about the same gain registered in 1957 over 1956. U.S.-Europe cargo reached 23,915.8 tons, up 16.5%. Here, too, the foreign lines led, carrying 59.9% against 40.1% for PAA, TWA and Seaboard & Western. On U.S.-Europe, the foreign lines carried 55.9%.

Mail tonnage increased 16.4% to 11,895.5. The U.S. lines maintained their big lead, hauling 63.5% of the total.

Pan American again led in passengers, cargo and mail. It carried 23.4% of all passengers, and 26.4% of those to and from the U.S. Then came TWA, BOAC, Scandinavian Airlines System, and KLM.

	AF	Alitalia	BOAC	Lufthansa	El Al	Iberia
Rev.-passengers	23,501	4,433	37,476	6,191	1,939	1,836
Seat capacity	38,301	10,059	60,467	12,949	5,824	6,525
% seats used	61.36	44.07	61.98	47.81	33.29	28.14
1st class flights	100	0	747	28	0	0
Mixed flights	2,014	710	1,918	1,165	328	333
Cargo flights	0	0	32	188	0	0
Cargo (tons)	1,262.7	369.1	1,726.5	1,152.2	381.2	88.1
Mail (tons)	468.5	250.2	899.8	666.5	46.5	38.1
Rev.-passengers	28,309	4,890	32,678	14,428	2,323	3,330
Seat capacity	42,142	9,173	45,794	23,182	4,144	7,809
% seats used	67.18	53.31	71.36	62.24	56.06	42.64
No. flights	12	0	17	0	2	0
Rev.-passengers	38,759	17,102	50,265	33,994	14,449	5,042
Seat capacity	61,684	30,291	70,516	48,974	21,600	12,580
% seats used	62.83	56.46	71.28	69.00	66.89	40.08
No. flights	1	1	8	5	50	0
Rev.-passengers	90,569	26,425	120,419	54,413	18,711	10,208
Seat capacity	142,127	49,523	176,777	85,105	31,568	26,914
% seats used	63.72	53.36	68.12	63.94	59.27	37.92
No. flights	2,127	711	2,690	1,198	372	333

	AF	Alitalia	BOAC	Lufthansa	El Al	Iberia
Rev.-passengers	12,522	2,147	18,409	2,831	899	872
Seat capacity	19,405	4,847	30,186	6,532	2,894	3,253
% seats used	64.53	44.30	61.65	43.34	31.06	26.81
1st class flights	51	0	374	14	0	0
Mixed flights	1,012	354	960	591	159	166
Cargo flights	0	0	16	96	0	0
Cargo (tons)	639.7	222.5	847.9	575.8	215.7	36.4
Mail (tons)	358.5	240.4	781.4	627.6	34.0	28.9
Rev.-passengers	15,347	2,774	17,292	8,440	960	1,735
Seat capacity	21,271	4,697	22,382	11,967	1,885	3,897
% seats used	72.15	59.06	77.26	70.53	50.93	44.26
No. flights	8	0	3	0	0	0
Rev.-passengers	21,758	10,159	25,044	16,867	7,893	2,763
Seat capacity	31,109	15,052	34,991	24,671	10,870	6,270
% seats used	69.94	67.49	71.57	68.37	72.61	44.05
No. flights	0	0	3	0	25	0
Rev.-passengers	49,627	15,080	60,945	28,138	9,752	5,359
Seat capacity	71,785	24,596	87,559	43,170	15,649	13,420
% seats used	69.13	61.31	69.60	65.17	62.32	39.93
No. flights	1,071	354	1,340	605	184	166

	AF	Alitalia	BOAC	Lufthansa	El Al	Iberia
Rev.-passengers	10,979	2,286	18,867	3,360	1,040	964
Seat capacity	18,896	5,212	30,281	6,417	2,930	3,272
% seats used	58.10	43.86	62.31	52.36	35.49	29.46
1st class flights	49	0	373	14	0	0
Mixed flights	1,002	356	958	574	161	167
Cargo flights	0	0	16	92	0	0
Cargo (tons)	623.0	146.6	880.6	576.4	165.5	51.7
Mail (tons)	110.0	9.8	118.4	38.9	12.5	9.2
Rev.-passengers	12,962	2,116	15,386	5,988	1,343	1,685
Seat capacity	20,871	4,476	23,412	11,215	2,259	3,912
% seats used	62.11	47.27	65.72	53.39	60.34	41.08
No. flights	4	0	14	0	2	0
Rev.-passengers	17,001	6,943	25,221	16,927	6,556	2,286
Seat capacity	30,575	15,239	35,525	24,303	10,730	6,310
% seats used	55.60	45.56	71.00	69.65	61.10	36.13
No. flights	1	1	5	5	25	0
Rev.-passengers	40,942	11,345	59,474	26,275	8,959	4,849
Seat capacity	70,342	24,927	89,218	41,935	15,919	13,495
% Seats used	58.20	45.51	66.66	62.66	56.28	35.93
No. flights	1,056	357	1,350	593	188	167

Gain In Record-Breaking 1958

Air Traffic Both Ways Between U.S., Canada and Europe, 1958

UNITED STATES TRAFFIC										CANADIAN TRAFFIC					
Irish	KLM	PAA	Qantas	Sabena	SAS	S&W	Swiss	TWA	U.S. TOTAL	BOAC	CPA	KLM	TCA	Canadian TOTAL	GRAND TOTAL
FIRST CLASS															
0	15,107	73,791	1,457	8,825	21,515	0	10,577	33,088	239,736	2,933	2,920	3,370	6,731	15,954	255,690
0	27,619	120,382	3,558	18,169	42,606	0	16,019	54,367	418,845	4,749	6,245	6,335	13,291	32,620	451,465
0	54.70	61.30	40.95	48.57	50.50	0	66.03	58.70	57.24	43.46	46.76	53.20	50.64	48.91	56.63
0	3	1,167	0	13	265	0	98	6	2,427	4	0	0	0	4	2,431
0	1,292	4,953	190	1,088	1,711	0	843	3,358	19,895	629	483	423	1,223	2,758	22,653
0	297	644	0	34	0	610	113	99	2,017	0	0	75	1	76	2,093
40.7	4,050.1	5,460.2	110.1	1,252.3	1,430.1	3,557.2	1,498.3	1,535.0	23,915.8	219.8	117.2	1,120.9	912.8	2,370.7	26,286.5
34.0	209.1	4,192.2	15.8	231.7	349.3	461.2	305.2	2,902.9	11,071.7	199.7	9.0	53.4	561.7	823.8	11,895.5
TOURIST															
0	21,771	62,647	2,670	12,129	8,381	0	6,095	40,912	240,563	6,329	7,261	3,906	16,837	34,333	274,896
0	35,281	106,161	5,193	22,082	12,716	0	9,710	73,934	397,321	11,857	11,255	6,130	24,174	53,416	450,737
0	61.71	59.01	51.42	54.93	65.91	0	62.77	55.34	60.55	53.38	64.51	63.72	69.66	64.27	60.99
0	13	172	1	59	5	0	0	70	351	2	0	10	0	12	363
ECONOMY CLASS															
9,406	40,986	141,660	1,143	37,696	73,391	0	25,009	86,484	575,186	18,930	12,210	16,208	37,740	85,088	660,274
25,410	72,779	216,269	3,172	67,590	112,241	0	38,334	145,345	926,785	30,351	16,811	24,162	45,872	117,196	1,043,981
37.02	54.32	65.50	36.03	55.77	65.39	0	65.24	59.50	62.06	62.37	72.63	67.08	82.27	72.60	63.25
270	644	495	0	319	850	0	0	709	3,372	0	0	124	0	124	3,496
ALL TRAFFIC															
9,406	77,864	278,098	5,270	58,650	103,287	0	41,681	160,484	1,055,485	28,192	22,391	23,484	61,308	135,375	1,190,860
25,410	135,679	442,812	11,923	107,841	167,563	0	64,063	275,646	1,742,951	48,957	34,311	36,627	83,337	203,223	1,946,183
37.02	57.39	62.80	44.20	54.39	61.64	0	65.06	58.22	60.56	57.58	65.26	64.12	73.57	66.61	61.19
270	1,972	6,787	191	1,479	2,831	0	941	4,143	26,045	635	483	567	1,223	2,898	28,943

Air Traffic Westbound Between U.S., Canada and Europe, 1958

UNITED STATES TRAFFIC										CANADIAN TRAFFIC					
Irish	KLM	PAA	Qantas	Sabena	SAS	S&W	Swiss	TWA	U.S. TOTAL	BOAC	CPA	KLM	TCA	Canadian TOTAL	GRAND TOTAL
FIRST CLASS															
0	7,710	38,839	728	3,764	10,177	0	5,024	17,518	121,640	1,182	1,858	1,831	3,424	8,295	129,935
0	13,763	61,108	1,784	9,116	21,357	0	7,969	28,169	210,383	3,381	3,112	3,191	6,570	16,254	226,637
0	56.02	63.56	40.81	41.29	47.65	0	63.04	62.19	57.82	34.96	59.70	57.38	52.12	51.03	57.33
0	2	581	0	6	133	0	48	3	1,212	2	0	0	0	2	1,214
0	640	2,479	96	545	858	0	422	1,657	9,939	319	242	215	612	1,388	11,327
0	139	299	0	15	0	290	57	44	956	0	0	68	0	68	1,024
10.4	1,976.7	2,770.9	70.9	712.8	642.0	1,603.3	856.5	867.5	12,049.0	151.4	101.7	793.0	668.3	1,714.4	13,763.4
23.9	174.9	936.2	11.7	207.5	262.8	223.4	260.5	769.2	4,940.9	197.9	4.3	42.8	56.8	301.8	5,242.7
TOURIST															
0	11,805	35,141	1,428	5,993	5,029	0	3,241	21,803	130,978	3,940	3,989	2,525	9,143	19,597	150,575
0	17,553	55,453	2,695	11,239	6,623	0	4,917	34,988	199,567	5,981	5,786	3,391	11,841	26,999	226,566
0	67.25	63.37	52.99	53.32	75.93	0	65.91	62.31	65.63	65.88	68.94	74.46	77.21	72.58	66.46
0	7	85	0	31	5	0	0	12	151	1	0	9	0	10	161
ECONOMY CLASS															
6,128	22,197	77,227	567	19,519	38,490	0	12,970	46,477	307,066	10,163	6,537	9,498	19,232	45,430	352,496
12,714	36,727	108,727	1,574	34,660	57,181	0	19,081	70,476	464,103	15,464	8,282	12,261	23,089	59,096	523,199
48.20	60.44	71.03	36.02	53.43	67.33	0	67.97	65.95	66.16	65.72	79.89	77.47	83.30	76.87	67.37
135	335	250	0	169	421	0	0	344	1,682	0	0	63	0	63	1,745
ALL TRAFFIC															
6,128	41,712	151,207	2,723	28,276	53,704	0	21,235	85,798	559,684	15,285	12,384	13,854	31,799	73,322	633,006
12,714	68,043	225,288	6,053	55,015	85,161	0	31,967	133,633	874,053	24,826	17,180	18,843	41,500	102,349	976,402
48.20	61.30	67.12	44.99	51.40	63.06	0	66.43	64.20	64.03	61.57	72.08	73.52	76.62	71.64	64.83
135	984	3,395	96	751	1,417	0	470	2,016	12,904	322	242	287	612	1,463	14,447

Air Traffic Eastbound Between U.S., Canada and Europe, 1958

UNITED STATES TRAFFIC										CANADIAN TRAFFIC					
Irish	KLM	PAA	Qantas	Sabena	SAS	S&W	Swiss	TWA	U.S. TOTAL	BOAC	CPA	KLM	TCA	Canadian TOTAL	GRAND TOTAL
FIRST CLASS															
0	7,397	34,952	729	5,061	11,338	0	5,553	15,570	118,096	1,751	1,062	1,539	3,307	7,659	125,755
0	13,856	59,274	1,774	9,053	21,249	0	8,050	28,198	208,462	3,368	3,133	3,144	6,721	16,366	224,828
0	53.38	58.97	41.09	55.90	53.36	0	68.98	55.22	56.65	51.99	33.90	48.95	49.20	46.80	56.93
0	1	586	0	7	132	0	50	3	1,215	2	0	0	0	2	1,217
0	452	2,474	94	543	853	0	421	1,701	9,956	310	241	208	611	1,370	11,326
0	158	345	0	19	0	320	56	55	1,061	0	0	7	1	8	1,069
30.3	2,073.4	2,689.3	39.2	539.5	788.1	1,953.9	641.8	667.5	11,866.8	68.4	15.5	327.9	244.5	656.3	12,523.1
10.1	34.9	3,256.0	4.1	24.2	86.5	237.8	44.7	2,133.7	6,130.8	1.8	4.7	10.6	504.9	522.0	6,652.8
TOURIST															
0	9,946	27,506	1,242	6,136	3,352	0	2,854	19,109	109,585	2,389	3,272	1,381	7,694	14,736	124,321
0	17,728	50,708	2,498	10,843	6,093	0	4,793	38,946	197,754	5,876	5,449	2,739	12,333	26,417	224,171
0	56.22	54.24	49.72	56.59	55.01	0	59.55	49.06	55.41	40.66	59.83	50.42	62.39	55.78	55.46
0	6	87	1	28	0	0	0	58	200	1	0	1	0	2	202
ECONOMY CLASS															
3,278	18,789	64,433	576	19,177	34,893	0	12,039	40,007	268,120	8,767	5,673	6,710	18,508	39,658	307,778
12,696	36,052	107,542	1,598	32,930	55,060	0	19,253	74,869	462,682	14,887	8,529	11,901	22,783	58,100	520,782
25.82	52.12	59.91	36.05	58.24	63.37	0	62.53	53.44	57.95	58.89	66.51	56.38	81.24	68.26	59.10
135	329	246	0	150	429	0	0	365	1,690	0	0	61	0	61	1,751
ALL TRAFFIC															
3,278	36,152	126,891	2,547	30,374	49,583	0	20,446	74,686	495,801	12,907	10,007	9,630	29,509	62,053	557,854
12,696	67,636	217,524	5,870	52,826	82,402	0	32,096	142,013	868,898	24,131	17,131	17,784	41,837	100,883	969,781
25.82	53.45	58.33	43.39	57.50	60.17	0	63.70	52.59	57.06	53.49	58.41	54.15	70.53	61.51	57.52
135	988	3,392	95	728	1,414	0	471	2,127	13,061	313	241	270	611	1,435	14,496

NOTES: (1) Cargo and mail totals include tonnage carried on both passenger and all-cargo flights; (2) total number of flights includes first-class, tourist, economy and mixed.

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U.S. AIRLINE TRAFFIC FOR YEAR 1958 vs 1957

This complete summary compiled by AIRLIFT magazine from Official CAB Records

DOMESTIC	Revenue Passengers (000)			Revenue Passenger Miles (000)			Total Ton-Miles Rev. Traffic			% Available Ton-Miles Used	
	1958	1957	% Change	1958	1957	% Change	1958	1957	% Change	1958	1957
American	7,208	7,513	— 4.1	4,906,061	5,042,291	— 2.7	592,596,102	596,300,679	— 0.6	57.1	57.7
Braniff	2,101	2,004	4.8	919,243	870,606	5.6	100,954,072	93,178,301	8.3	48.8	47.3
Capital	3,541	3,950	—10.4	1,413,982	1,513,845	— 6.6	147,733,125	157,104,115	— 5.9	47.4	47.5
Continental	854	829	3.0	422,463	363,254	16.3	44,292,995	37,977,569	16.6	43.7	44.6
Delta	2,783	2,654	4.9	1,408,958	1,319,334	6.7	156,906,211	143,065,719	9.7	53.6	54.9
Eastern	6,935	7,820	—11.3	3,813,473	4,398,357	—13.3	395,082,921	456,330,425	—13.4	48.2	47.0
National	1,568	1,352	15.9	1,001,430	897,600	11.6	107,949,023	96,135,268	12.3	47.3	50.2
Northeast	958	765	25.2	409,235	246,095	66.3	41,890,682	24,980,344	67.7	39.3	40.3
Northwest	1,562	1,380	13.2	1,120,240	947,409	18.2	127,369,240	107,679,166	18.3	49.0	50.2
Trans World	4,404	4,537	— 2.9	3,671,913	3,661,759	0.3	396,557,521	396,502,131	0.1	57.3	55.6
United	6,793	6,193	9.7	4,962,564	4,615,944	7.5	585,877,042	537,991,131	8.9	57.8	56.3
Western	953	1,370	—30.4	506,711	687,661	—26.3	53,739,924	72,792,257	—26.2	45.6	54.1
TOTALS	**39,660**	**40,367**	**— 1.8**	**24,556,273**	**24,564,155**	**— 0.1**	**2,750,948,858**	**2,720,037,105**	**1.1**	**51.4**	**52.8**
TERRITORIAL											
Caribair	253	227	11.5	17,675	16,048	10.1	1,913,443	1,742,124	9.8	64.8	59.0
Hawaiian	409	418	— 2.2	88,043	62,907	39.9	9,172,730	6,731,576	36.3	62.4	56.7
Trans Pacific	183	180	1.7	24,781	28,192	12.1	2,092,048	2,333,566	10.3	56.2	57.6
TOTALS	**845**	**825**	**2.4**	**130,499**	**107,147**	**21.8**	**13,178,221**	**10,807,266**	**21.9**	**61.7**	**57.2**

UAL Operations Suspended Feb. 21 to June 10, 1958 because of strike
AAL Operations Suspended Dec. 19, 1958 to Jan. 11, 1959 because of strike
EAL Operations Suspended Nov. 24 to Dec. 31, 1958 because of strike
TWA Operations Suspended Nov. 21 to Dec. 3, 1958 because of strike
CAP Operations Suspended Oct. 15 to Nov. 22, 1958 because of strike

LOCAL SERVICE											
Allegheny	476	440	8.2	84,196	77,011	9.3	8,638,754	7,826,483	10.4	47.4	44.2
Bonanza	182	150	21.3	42,336	33,044	28.1	4,238,219	3,312,115	28.0	43.7	43.7
Central	138	119	15.9	26,872	23,726	13.3	2,780,325	2,436,625	14.1	31.0	30.1
Frontier	232	219	5.9	62,704	59,343	5.7	7,036,527	6,747,030	4.3	56.9	60.3
Lake Central	183	161	12.4	29,289	25,549	14.6	3,024,510	2,641,417	14.5	41.1	39.7
Mohawk	454	351	29.3	87,291	81,405	7.2	8,771,278	8,253,058	6.3	52.1	48.9
North Central	746	659	13.2	125,931	106,723	17.9	12,792,316	10,843,896	18.0	47.3	47.6
Ozark	424	391	8.4	72,578	63,835	13.7	7,464,695	6,584,376	13.4	47.7	43.3
Pacific	376	337	11.6	83,468	72,994	14.3	8,245,835	7,206,535	14.4	49.6	51.6
Piedmont	411	401	2.5	86,435	83,808	3.1	8,754,574	8,474,141	3.3	52.1	53.3
Southern	223	212	5.2	41,818	38,318	9.1	4,333,498	3,919,780	10.5	39.6	39.3
Trans-Texas	240	243	— 1.2	54,934	55,330	— 0.7	5,875,284	5,823,430	0.9	39.9	38.7
West Coast	248	254	— 2.4	46,520	45,128	3.1	4,634,051	4,445,150	4.2	45.8	46.1
TOTALS	**4,333**	**3,937**	**10.1**	**844,372**	**766,214**	**10.2**	**86,589,866**	**78,514,036**	**10.3**	**49.7**	**46.0**
HELICOPTER SERVICE											
Chicago	109	55	98.2	1,997	895	123.1	208,189	111,907	86.0	28.5	30.4
Los Angeles	32	31	3.2	1,182	1,131	4.5	183,256	177,219	3.4	58.4	58.9
New York	91	69	31.9	1,761	1,276	38.0	202,610	160,071	26.6	44.6	41.4
TOTALS	**232**	**155**	**49.7**	**4,940**	**3,302**	**49.6**	**594,055**	**449,197**	**32.2**	**39.7**	**42.5**
INTERNATIONAL											
American	126	136	— 7.3	115,302	100,303	14.9	15,438,215	14,375,725	7.4	56.0	66.3
Braniff	47	44	6.8	88,802	92,381	— 3.9	11,085,775	11,258,882	— 1.5	44.7	49.5
Delta	57	69	—17.4	68,018	81,715	—16.8	8,164,434	9,801,721	—16.7	45.8	54.6
Eastern, Overseas	342	325	5.2	477,203	436,960	9.2	51,374,911	47,342,655	8.5	57.6	54.3
San Juan	252	268	— 6.0	377,546	382,852	— 1.4	40,392,338	41,503,563	— 2.7	61.3	60.4
Bermuda	50	41	21.9	39,362	31,807	23.8	4,096,334	3,352,370	22.2	45.8	47.9
Mexico	40	16	150.0	60,275	22,301	170.3	6,886,239	2,486,722	176.9	48.1	48.6
National	96	78	23.1	68,302	55,660	22.7	7,974,136	6,377,148	25.0	46.6	47.1
Northwest	141	120	17.5	315,007	261,915	20.3	58,077,396	48,130,395	20.7	65.9	67.5
Hawaiian	20	14	42.8	52,664	38,541	36.6	6,013,821	4,404,121	36.5	63.5	57.3
Panagra	129	139	— 7.2	163,351	173,736	— 6.0	23,883,977	24,455,835	— 2.3	57.1	60.2
Pan American, System	2,656	2,685	— 1.1	3,893,530	3,876,073	0.4	534,940,722	523,501,606	2.2	62.3	61.9
Latin America	1,167	1,252	— 6.8	1,261,245	1,289,706	— 2.2	177,086,478	179,293,213	— 1.2	63.8	63.6
Atlantic	1,180	1,084	8.9	1,595,015	1,439,933	10.8	212,538,244	191,499,629	11.0	59.0	61.6
Pacific	266	279	— 4.7	988,999	1,068,656	— 7.5	138,026,677	141,646,964	— 2.5	69.0	66.8
PDX/SEA-HON.	15	20	—25.0	43,245	57,624	—33.2	5,042,950	6,361,607	—20.7	48.0	52.2
Alaska	43	70	—38.6	48,271	77,778	—37.9	7,289,323	11,061,800	—32.5	53.1	51.9
Trans Caribbean	11	....	...	17,584	.....	...	1,550,944	.....	...	...	...
Trans World	319	280	13.9	920,762	734,739	25.3	117,731,859	95,912,332	22.7	59.6	65.2
United	101	101	...	251,291	252,364	— 0.4	28,393,801	27,898,672	1.8	59.0	61.9
Western	17	10	70.0	26,732	15,066	77.4	2,970,338	1,675,714	77.3	54.3	55.8
TOTALS	**4,042**	**4,021**	**0.5**	**6,405,884**	**6,080,912**	**5.3**	**861,586,508**	**810,730,685**	**6.2**	**64.3**	**62.5**

WAL Operations Suspended Feb. 21 to June 10, 1958 because of strike
TWA Operations Suspended Nov. 21 to Dec. 3, 1958 because of strike
AAL Operations Suspended Dec. 19, 1958 to Jan. 11, 1959 because of strike
EAL Operations Suspended Nov. 24 to Dec. 31, 1958 because of strike

ALASKAN											
Alaska	72	63	14.3	38,686	25,233	53.3	7,418,435	6,927,860	7.1	43.0	45.6
Alaska Coastal	51	52	— 1.9	4,610	4,629	— 0.4	569,649	568,544	0.2	64.8	64.5
Cordova	12	20	—40.0	1,937	5,135	—62.3	483,056	1,995,790	—75.7	48.5	49.3
Ellis	53	63	—15.9	3,106	3,382	— 8.2	368,597	400,243	— 7.9	69.7	67.7
Nor. Consolidated	22	20	10.0	6,928	6,630	4.4	1,749,888	1,876,149	— 6.7	61.3	61.3
Pacific Northern	113	108	4.6	105,595	105,820	— 0.2	15,937,354	15,564,481	2.4	60.6	60.8
Reeve	13	9	44.4	10,171	7,027	44.7	2,584,092	1,335,464	93.4	56.9	48.3
Wien	35	28	25.0	11,636	9,621	20.9	3,790,931	3,867,333	— 1.9	57.6	62.2
TOTALS	**371**	**363**	**2.2**	**182,669**	**167,477**	**9.0**	**32,902,002**	**32,535,864**	**1.1**	**54.9**	**55.1**

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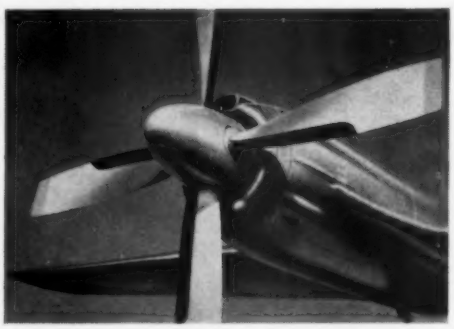

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Aircoach Traffic Gains 6% in 1958

Low-fare service grew at slower rate but reached 40.9% of total traffic; bigger gain seen in '59

Aircoach traffic on the domestic trunk airlines moved sluggishly ahead in 1958 despite a decline in overall passenger traffic generally attributed to the recession and serious labor strife. But early 1959 results point to a resumption of the growth rate that saw the low-fare experiment of the late 1940s seriously challenge first-class traffic as the No. 1 revenue producer for the airlines.

In 1958, the airlines' basic low-fare service produced a 6% increase in traffic, passing the 10-billion passenger-mile mark for the first time. This compares with a 13% increase in coach traffic in 1957 and an 18% increase in 1956.

That a healthy rebound is possible this year can be seen from results of the first two months when coach traffic climbed 14% above comparable 1958 totals and this, despite labor difficulties which depressed early year results on two major coach operators—American Airlines and Eastern Air Lines.

If these early results hold true for the entire year—and many airline officials look upon them as conservative—coach passenger miles will exceed 11.4 billion and coach revenue will approximate $516 million. Last year's coach revenues, though below anticipated results, nevertheless were in excess of $450 million, or more than total revenues of the trunklines from all sources when coach service was inaugurated 10 years ago.

Significant in 1958 was the fact that coach accounted for 40.9% of the domestic trunks' total passenger traffic. Since 1952, the first year of noticeable coach development, this yardstick for measuring coach impact has increased steadily as follows:

1952	18.8%
1953	26.5%
1954	32.9%
1955	34.9%
1956	35.6%
1957	38.3%
1958	40.9%

The companies with 50% or more of their passenger business derived from coach travelers was increased to three as Northeast Airlines saw its coach-to-total ratio skyrocket from 43.95% in 1957 to a domestic trunkline record high of 65.09% in 1958. The other long-time occupants of this bracket, National Airlines and Trans World Airlines, had 1958 ratios of 55% and 52.07%, respectively.

Just outside the 50%-plus group are Eastern Air Lines with 48.49% and Northwest Airlines with 48.17%.

In a year that saw the two perennial leaders in terms of total coach traffic—TWA and Eastern—hard hit by strikes, the top spot went to United Air Lines whose 2,029,963,000 coach passenger miles fell just short of the all-time domestic coach record set by Eastern in 1957.

Meanwhile, there are interesting new developments on the coach scene which could have a marked impact during the present year. And these are apart from the major impact that jet transports are widely expected to produce.

One is the move by National Airlines to reduce so-called "night coach" fares 25% for flights on Mondays, Tuesdays, and Wednesdays which depart during the hours of 10 p.m. and 3:59 a.m. At presstime, the proposal, objected to by several airlines, was allowed by CAB to become effective.

NAL's fares, which were also adopted by competing airlines place scheduled air service at fares below those of bus lines, the lowest priced transportation medium in the country.

It is somewhat paradoxical that NAL is now the forerunner in a fight concerning night coach fares. Nine years ago it led the industry in a move to pierce the curtain CAB had erected prohibiting scheduled coach service in the daytime. In these days, all coach service had to be conducted at off-hours in the night to distinguish between low-fare coach service and higher-fare standard service.

And another development, significant at least as a symbol of how far the coach program has come in a decade, is a CAB investigation into the adequacy of aircoach service in the New York area. The 1950s have been marked by CAB proceedings into the adequacy of air service generally at numerous points and in numerous areas throughout the country. But the specialized nature of the new coach investigation marks the first time the "adequacy of service" provisions of the act have been applied by CAB to low-fare coach service as such.

How Airlines Rank in Coach Traffic

1958 vs. 1957

	1958 Revenue Passenger Miles (000)			1957 Revenue Passenger Miles (000)		
	Coach	Total	% Coach	Coach	Total	% Coach
United	4,962,564	2,029,963	40.91	4,615,944	1,639,798	35.52
TWA	3,671,913	1,911,892	52.07	3,661,759	2,014,515	55.00
Eastern	3,813,473	1,849,229	48.49	4,398,357	2,103,425	47.82
American	4,906,061	1,684,497	34.33	5,042,291	1,540,287	30.54
Delta	1,408,958	580,045	41.17	1,319,334	518,897	39.33
National	1,001,430	550,824	55.00	897,600	472,588	52.65
Northwest	1,120,240	539,566	48.17	947,409	438,582	46.29
Northeast	409,235	266,371	65.09	246,095	108,159	43.95
Western	506,711	188,819	37.27	687,661	221,844	32.26
Braniff	919,243	155,235	16.89	870,606	148,370	17.04
Capital	1,413,982	151,461	10.71	1,513,845	151,527	10.01
Continental	422,463	136,754	32.37	363,254	129,387	35.62
Totals	24,556,273	10,044,656	40.90	24,564,155	9,487,379	38.62

Note: Performance of American, Eastern, Capital, TWA and Western influenced by strikes during 1958 as follows: AA, 21 days; EAL, 38 days; Capital, 38 days; TWA, 13 days and Western, 110 days.

Source: AIRLIFT Survey.

Strikes Reshuffle Airline Traffic Rankings

United Air Lines and Pan American each garnered two of the five top traffic rankings in 1958 as the impact of labor shutdowns reshuffled the position of airlines from previous years.

Despite a year-end pilot strike, American Airlines regained the top position in passengers carrier. Eastern Air Lines, leader in this category in 1957, fell 107,182 passengers shy of AA as a result of its 38-day strike in November and December.

Except for Northeast Airlines, which bypassed Continental to assume No. 12 position, the ranks of other trunk carriers in passengers carried remained unchanged.

United Air Lines, which came through the year unscathed by strikes, assumed the front position in revenue passenger miles. But this distinction could very well have resulted from the combined 26-day shutdown of two competing transcontinental carriers—TWA and American. AA ranked second, some 192 million passenger miles behind UAL. TWA displaced Eastern and both Delta and Northwest moved ahead of Capital primarily as the result of strikes. National showed the only non-strike gain in ranking, moving into No. 9 position ahead of Braniff, although traffic diverted by EAL's shutdown could be the explanation.

In mail traffic, Northwest moved into No. 4 spot ahead of American and Capital, despite its strike, showed a 2.1 million ton-mile increase to displace Delta from No. 7 spot. National moved ahead of Western into No. 10 position to round out the changes over '57.

In express ton-miles United led the industry carrying 11 million ton-miles, 1.4 million better than American in second place. Carriers repeated their 1957 rankings with the exception of National's move into No. 9 position ahead of strike-burdened Western.

In freight, Pan American topped the combination carriers with 100.9 million ton-miles although Flying Tigers (not shown) recorded 104.0 million in all-cargo operations. American ranked third with 94.4 million, United next with 70 million, then Seaboard & Western with 67.5 million (not shown).

Among the local airlines, North Central remained far in the lead in passengers carried, some 270,000 ahead of second place Allegheny. The only change in position was recorded by Ozark which moved into 4th place ahead of Piedmont.

TRAFFIC RATINGS—1958

TRUNKS AND INTERNATIONAL

Rank	Airline	Revenue Passengers	Rank	Airline	Revenue Passenger Miles (000)	Rank	Airline	Mail Ton-Miles	Rank	Airline	Express Ton-Miles	Rank	Airline	Freight Ton-Miles
1.	American	7,334,426	1.	United	5,213,855	1.	Pan American	35,802,859	1.	United	11,024,527	1.	Pan American	100,904,914
2.	Eastern	7,277,244	2.	American	5,021,363	2.	United	32,805,083	2.	American	9,612,293	2.	American	94,393,110
3.	United	6,894,125	3.	TWA	4,592,675	3.	TWA	24,610,626	3.	TWA	7,065,422	3.	United	67,995,298
4.	TWA	4,723,159	4.	Eastern	4,290,676	4.	Northwest	20,937,159	4.	Eastern	4,884,716	4.	TWA	34,723,735
5.	Capital	3,541,292	5.	Pan American	3,893,530	5.	American	20,362,227	5.	Delta	3,269,680	5.	Delta	20,965,428
6.	Delta	2,840,390	6.	Delta	1,476,976	6.	Eastern	10,951,151	6.	Northwest	3,029,515	6.	Northwest	20,344,229
7.	Pan American	2,656,326	7.	Northwest	1,435,247	7.	Capital	5,702,523	7.	Capital	2,809,245	7.	Eastern	13,897,481
8.	Braniff	2,147,653	8.	Capital	1,413,982	8.	Delta	5,282,793	8.	Braniff	2,055,696	8.	Braniff	7,888,653
9.	Northwest	1,703,300	9.	National	1,069,732	9.	Braniff	4,067,391	9.	National	782,720	9.	National	6,740,347
10.	National	1,664,561	10.	Braniff	1,008,045	10.	National	3,959,512	10.	Western	708,053	10.	Panagra	5,121,823
11.	Western	970,498	11.	Western	533,443	11.	Western	2,148,460	11.	Continental	542,825	11.	Capital	3,771,890
12.	Northeast	957,961	12.	Continental	422,463	12.	Continental	1,207,335	12.	Northeast	372,492	12.	Western	2,441,267
13.	Continental	853,931	13.	Northeast	409,235	13.	Northeast	1,107,874	13.	Pan American	.....	13.	Continental	1,968,751
14.	Panagra	128,776	14.	Panagra	163,351	14.	Panagra	838,087	14.	Panagra	.....	14.	Northeast	1,174,937
15.	Trans Caribbean	69,883	15.	Trans Caribbean	124,842	15.	Trans Caribbean	.....	15.	Trans Caribbean	.....	15.	Trans Caribbean	469,946

LOCAL SERVICE

Rank	Airline	Revenue Passengers	Rank	Airline	Revenue Passenger Miles (000)	Rank	Airline	Mail Ton-Miles	Rank	Airline	Express Ton-Miles	Rank	Airline	Freight Ton-Miles
1.	North Central	746,496	1.	North Central	125,931	1.	North Central	302,144	1.	North Central	406,476	1.	Frontier	672,940
2.	Allegheny	475,852	2.	Mohawk	87,291	2.	Frontier	230,449	2.	Allegheny	224,634	2.	Trans-Texas	331,412
3.	Mohawk	453,765	3.	Piedmont	86,435	3.	Trans-Texas	176,654	3.	Ozark	210,327	3.	Allegheny	235,759
4.	Ozark	423,785	4.	Allegheny	84,196	4.	Piedmont	170,815	4.	Lake Central	174,266	4.	Ozark	191,455
5.	Piedmont	410,891	5.	Pacific	83,468	5.	Allegheny	139,042	5.	Mohawk	165,914	5.	Mohawk	179,682
6.	Pacific	375,718	6.	Ozark	72,578	6.	Pacific	133,624	6.	Piedmont	145,056	6.	Pidemont	152,422
7.	West Coast	248,436	7.	Frontier	62,704	7.	Ozark	131,418	7.	Southern	120,395	7.	Central	107,349
8.	Trans-Texas	240,439	8.	Trans-Texas	54,934	8.	Southern	111,436	8.	Trans-Texas	101,458	8.	West Coast	104,804
9.	Frontier	231,935	9.	West Coast	46,520	9.	Mohawk	92,657	9.	Frontier	100,594	9.	Bonanza	93,110
10.	Southern	222,956	10.	Bonanza	42,336	10.	Central	66,361	10.	Pacific	57,215	10.	Pacific	91,983
11.	Lake Central	182,589	11.	Southern	41,818	11.	Bonanza	64,515	11.	Central	34,490	11.	Southern	91,482
12.	Bonanza	182,086	12.	Lake Central	29,289	12.	West Coast	56,189	12.	Bonanza	31,420	12.	Lake Central	.....
13.	Central	138,090	13.	Central	26,872	13.	Lake Central	43,291	13.	West Coast	30,042	13.	North Central	.....

HELICOPTER

1.	Chicago	189,136	1.	Chicago	1,997	1.	Los Angeles	48,005	1.	Los Angeles	22,527	1.	New York	6,127
2.	New York	91,114	2.	New York	1,761	2.	New York	17,823	2.	New York	10,378	2.	Los Angeles	.....
3.	Los Angeles	31,663	3.	Los Angeles	1,181	3.	Chicago	17,614	3.	Chicago	.....	3.	Chicago	.....

ALASKAN

1.	Pacific Northern	112,871	1.	Pacific Northern	105,595	1.	Pacific Northern	1,263,317	1.	Pacific Northern	48,396	1.	Pacific Northern	3,201,413
2.	Alaska	72,049	2.	Alaska	38,686	2.	Alaska	683,381	2.	Alaska	34,878	2.	Alaska	2,738,331
3.	Ellis	62,521	3.	Wien	11,636	3.	Wien	397,134	3.	Alaska Coastal	.....	3.	Wien	2,197,258
4.	Alaska Coastal	51,458	4.	Reeve	10,171	4.	Reeve	350,968	4.	Cordova	.....	4.	Reeve	1,119,364
5.	Wien	35,087	5.	Nor. Consolidated	6,928	5.	Nor. Consolidated	301,719	5.	Ellis	.....	5.	Nor. Consolidated	687,159
6.	Nor. Consolidated	21,805	6.	Alaska Coastal	4,610	6.	Cordova	49,253	6.	Nor. Consolidated	.....	6.	Cordova	233,994
7.	Reeve	12,745	7.	Ellis	3,106	7.	Alaska Coastal	48,352	7.	Reeve	.....	7.	Alaska Coastal	49,543
8.	Cordova	11,446	8.	Cordova	1,937	8.	Ellis	24,005	8.	Wien	.....	8.	Ellis	28,052

TERRITORIAL

1.	Hawaiian	409,053	1.	Hawaiian	88,043	1.	Hawaiian	58,499	1.	Hawaiian	.....	1.	Hawaiian	1,498,932
2.	Caribair	253,421	2.	Trans Pacific	24,781	2.	Caribair	19,913	2.	Caribair	.....	2.	Trans Pacific	91,668
3.	Trans Pacific	183,005	3.	Caribair	17,675	3.	Trans Pacific	9,976	3.	Trans Pacific	.....	3.	Caribair	43,201

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U.S. Airline Transports

	Boeing		Convair		Curtiss	Douglass					Fairchild	Lockheed					Martin	Vickers	Misc.	Total
	377	707	240	340 440	C-46	DC-3	DC-4	DC-6	DC-6A/B	DC-7 7B/C	F-27	049	188-A	749/A	1049	1649A	202/404	Viscount		
AAXICO	..	..	..	..	24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	24
Aerovias Sud	..	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	3
Alaska Airlines	..	..	..	..	3	1	2	3	..	..	..	..	..	..	..	..	..	..	..	9
Alaska Coastal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8[5]	8
Allegheny	..	..	..	..	..	15	..	..	..	..	..	..	..	..	..	..	8	..	..	23
Aloha	..	..	..	..	..	8	..	..	..	..	..	..	..	..	..	..	..	..	..	8
American	..	..	52	..	..	..	..	50	31	58	..	..	..	..	..	..	..	..	..	191
Bonanza	..	..	..	..	..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	10
Braniff	..	..	..	31	2	19	..	10	..	6	..	2	..	..	..	..	..	..	..	70
Capital	..	..	..	..	..	18	12	..	..	..	..	11	..	..	..	..	..	60	..	101
Caribbean-Atlantic	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	5
Central	..	..	..	..	..	14	..	..	..	..	..	..	..	..	..	..	..	..	..	14
Chicago	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8[1]	8
Continental	..	..	..	8	..	10	..	..	3	5	..	..	..	..	..	..	..	12	..	38
Cordova	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	2[6]	4
Delta	..	..	..	28	5	12	..	7	..	21	..	..	..	..	..	..	..	..	..	73
Eastern	..	..	..	20	..	..	..	..	7	48	..	..	9	17	38	..	56	..	..	195
Ellis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9[5]	9
Flying Tiger	..	..	..	..	2	..	..	..	2	..	..	..	..	..	..	..	..	..	..	4
Frontier	..	..	..	..	..	17	..	..	..	..	..	..	..	..	..	..	..	..	..	17
Hawaiian	..	..	..	5	..	8	..	..	..	..	..	..	..	..	..	..	..	..	..	13
Lake Central	..	..	..	..	..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	10
Los Angeles	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7[3]	7
Mackey	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	4
Mohawk	..	..	10	..	..	8	..	..	..	..	..	..	..	..	..	..	..	..	..	18
National	..	..	..	18	..	..	..	4	8	8	..	..	..	..	4	..	..	..	7[4]	49
New York	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6[5]	6
North Central	..	..	..	..	..	32	..	..	..	..	..	..	..	..	..	..	..	..	..	32
Northeast	..	..	3	..	..	11	..	..	10	..	..	..	..	..	..	..	..	8	..	32
Northern Consol.	..	..	..	..	..	4	..	..	..	..	2	..	..	..	..	..	..	..	..	6
Northwest	9	..	..	..	..	4	12	..	21	17	..	..	..	..	..	..	..	..	..	63
Ozark	..	..	..	..	..	24	..	..	..	..	..	..	..	..	..	..	..	..	..	24
Pacific Air Lines	..	..	..	..	..	11	..	..	..	..	..	..	..	..	..	..	8	..	..	19
Pacific Northern	..	..	..	..	..	4	1	..	..	..	..	..	..	4	..	..	..	..	..	9
Pan American	23	6	..	..	..	..	22	27	47	33	..	..	..	..	..	..	..	..	..	158
PANAGRA	..	..	..	..	..	4	2	1	4	5	..	..	..	..	..	..	..	..	..	16
Piedmont	..	..	..	..	..	21	..	..	..	..	4	..	..	..	..	..	..	..	..	25
Reeve	..	..	..	..	1	2	1	..	..	..	..	..	..	..	..	..	..	..	1[5]	5
Resort	..	..	..	..	..	..	10	..	..	..	..	..	..	..	..	..	..	..	..	10
Riddle	..	..	..	..	30	..	2	..	..	..	..	..	..	..	..	..	..	..	..	32
Seaboard & Western	..	..	..	..	1	..	3	..	..	..	..	..	..	..	8	..	..	..	..	12
Slick	..	..	..	..	3	..	1	..	3	..	..	..	..	..	..	..	..	..	..	7
Southern	..	..	..	..	..	16	..	..	..	..	..	..	..	..	..	..	..	..	..	16
Trans Caribbean	..	..	..	..	..	..	1	..	3	..	..	..	..	..	..	..	..	..	..	4
Trans World	..	..	..	..	..	..	6	..	..	..	..	32	..	39	46	29	37	..	..	189
Trans-Texas	..	..	..	..	..	21	..	..	..	..	..	..	..	..	..	..	..	..	..	21
UMCA	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
United	..	..	..	52	..	..	..	42	48	55	..	..	..	..	..	..	..	..	..	197
West Coast	..	..	..	..	..	14	..	..	..	..	6	..	..	..	..	..	..	..	..	20
Western	..	..	6	..	..	2	..	..	27	..	..	..	..	..	..	..	..	..	..	35
Wein Alaska	..	..	..	..	5	2	..	..	..	..	..	..	..	..	..	..	..	..	..	7
TOTALS	32	6	71	162	78	331	78	144	214	256	12	45	9	60	96	29	109	80	48	1860

Note: All figures as of December 31, 1958
[1] 3 Bell 47's & 5 S-58's
[2] 2 S-51's & 5 S-55's
[3] 1 Bell 47 & 5 Vertol 44B's
[4] Lodestars
[5] Grumman G-21's
[6] Grumman 44's

Source: Ray & Ray

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Circle No. 1 on Reader Service Card.

AIRCRAFT LOAD FACTORS

Load factor for Pan American's Boeing 707 from October 26 to the year end averaged 87.6% according to an AIRLIFT survey. PAA also reported an 82.8 percentage of revenue to available ton-miles for the big jet.

Generally, load factors for 1958 were mixed; some up, some down. In their first-class services during the year, carriers' load factors generally averaged in the 65 to 67% area.

For the Fairchild F-27, seeing first service among the local airlines, Piedmont had a load factor of 63.1% and West Coast, 53.4%.

Airline	*No. Aircraft*	*Load Factor %*	*% Rev. to Avail. Ton-Miles*
BOEING 377			
PAA	23	63.6	65.7
NWA	9	51.8	41.9
BOEING 707			
PAA	6	87.6	82.8
CONVAIR 240			
AA	52	69.3	70.9
MOH	10	52.8	53.4
NEA	3	54.6	55.5
WAL	6	56.4	60.0
CONVAIR 340/440			
BNF	31	58.8	53.4
CAL	8	51.1	43.6
DAL	28	57.7	55.2
EAL*	20	51.3	52.3
HAL	5	60.6	54.4
NAL	18	50.2	41.3
UAL	52	57.7	52.8
*Convair 440's Only			
CURTISS C-46			
AAX	23	...	58.4
ASA	3	30.4	46.0
ASA INT'L[1]	3	...	76.0
BNF-C	2	...	43.8
DAL	5	...	51.5
REV	1	...	...
RID	30	...	89.5
WEN	5	18.5	50.4
[1] Sept. 30, 1958			
DOUGLAS DC-3			
AAA	15	48.0	49.4
AAH	8	55.6	55.8
ASA	1	25.6	44.5
BAL	10	45.4	43.6
BNF	19	51.6	51.9
CAL	10[1]	48.2	46.5
CAP	18	53.2	51.9
CBA	5	59.4	64.8
CEN	14	34.1	30.9
COA	2	37.3	42.9
DAL	10	47.4	50.7
DAL-C	2	...	73.9
FAL	17	48.3	56.9
HAL	6	53.6	53.4
LCA	10	38.1	41.1
MAK	2	35.7	44.4
MOH	8	49.4	48.8
NCA	4	45.2	62.1
NEA	11	56.4	56.6
NOR	32	45.4	45.9
NWA	0	51.3	50.2
OZA	24	44.8	47.7
PAC	11	46.9	46.7
PAI	21	52.0	51.7
Panagra	4	56.5	61.7
PNA	4	37.2	56.7
REV	2	...	...

[1]—Leased
C—Cargo

SAS OPENS CARAVELLE PURE JET SERVICE IN EUROPE, AFRICA AND THE MIDDLE EAST AT NO JET SURCHARGE. THE SAS PURE JET NETWORK SERVES 22 CITIES - MORE THAN ANY OTHER AIRLINE IN THE WORLD!...ALL THIS PLUS SAS DC-7C LUXURY LEADERSHIP BOTH TRANSATLANTIC AND TRANSPOLAR....

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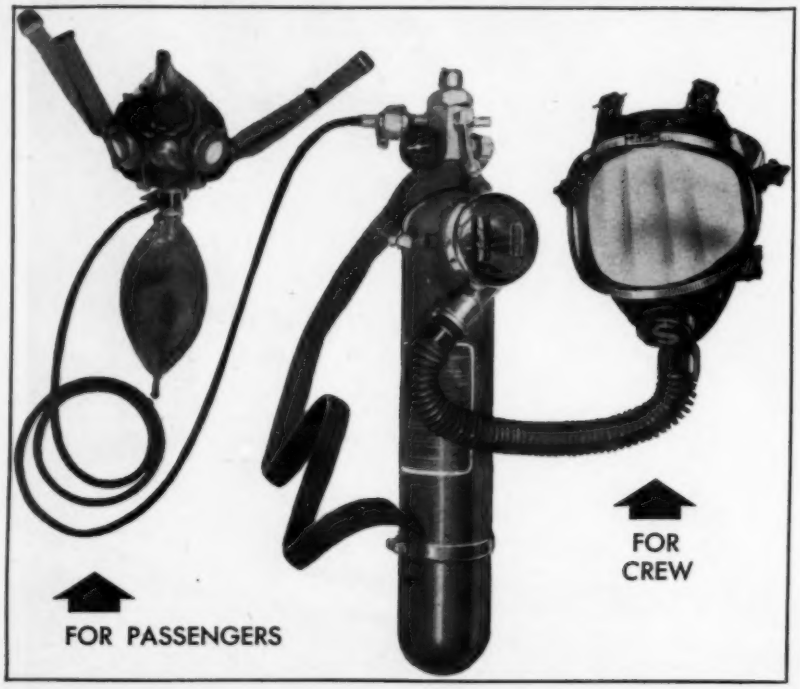
PORTABLE OXYGEN UNIT



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Canadair	Northeast
Capital	Northwest
Continental	Sud Aviation
Convair	Trans World
DeHaviland	United
Delta	Vickers
Douglas	Western

The Scott 5600 Portable has achieved a phenomenal acceptance record in the aviation industry. It is now standard oxygen equipment with almost every airline and air frame manufacturer. The reason for its popularity is the dual oxygen-supply feature; constant flow to passengers and "demand" for crew.

Another equally important reason is the SCOTTORAMIC Face Mask, which provides unlimited vision and protection from smoke and fumes. It is the greatest advance in the history of protective mask design. Let us send you complete information.

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Circle No. 2 on Reader Service Card.

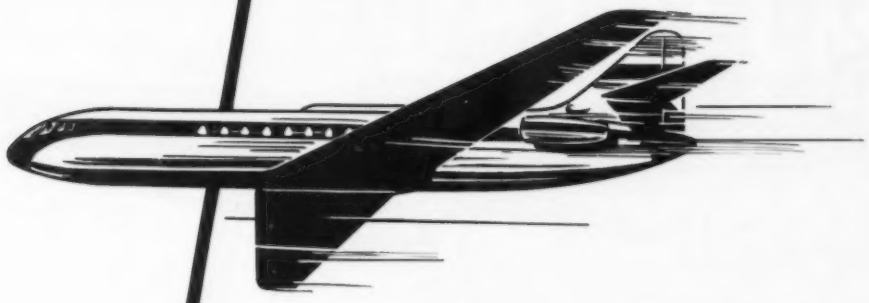
Airline	*No. Aircraft*	*Load Factor %*	*% Rev. to Avail. Ton-Miles*
SOU	16	39.9	39.5
TTA	21	38.7	39.9
WAL	2	52.2	55.2
WCA	14	47.0	44.9
WEN	2	30.3	61.1
DOUGLAS DC-4			
ASA	2	21.0	37.9
ASA INT'L[1]	1	...	90.0
CAP	12	50.0	44.2
MAK	3	38.5	39.3
NWA	12	43.3	42.1
PAA	22	69.3	62.0
Panagra	2	43.3	55.2
PNA	1	38.6	46.6
RAL	10	...	78.2
RID	2	...	75.1
TRC	1	77.5	90.2
TWA-C	6	...	54.9
DOUGLAS DC-6			
ASA	3	46.8	40.3
AA	50	67.6	62.9
BNF	10	57.9	52.3
DAL	7	61.4	64.7
NAL	4	57.8	49.2
Panagra	1	61.5	61.8
UAL	42	69.9	63.4
DOUGLAS DC-6A (CARGO)			
AA	10	...	68.2
FLT	2	...	...
PAA	4	...	68.0
SLI	3	...	...
UAL-C	7	...	68.1

[1] Sept. 30, 1958
C—Cargo

DOUGLAS DC-6B			
AA	21	60.9	49.6
CAL[1]	3	67.1	52.6
EAL	7	61.7	66.5
HAL*	1	83.9	82.3
NAL	8	51.8	45.8
NEA	10	44.4	35.4
NWA	21	55.1	52.8
PAA-ATL	43	60.0	61.3
Panagra	4	56.6	61.9
TRC	3	81.0	70.3
UAL	41	67.9	56.5
WAL	27	54.1	44.9
DOUGLAS DC-7			
AA	58	65.0	53.1
DAL*	21	58.2	48.8
NAL*	8	56.5	45.0
UAL	55	67.6	55.4
DOUGLAS DC-7B			
CAL	5	46.3	36.3
PAA	7	65.2	62.3
Panagra	5	51.0	55.3
DOUGLAS DC-7C			
BNF	6	58.6	37.7
NWA	17	59.0	61.7
PAA	26	60.9	59.2
FAIRCHILD F-27			
NCA	2	28.8	49.0
PAI	4	63.1	67.6
WCA	6	53.4	52.9
GRUMMAN 21A			
ACA	8	63.9	63.3
ES	9	60.8	42.0
GRUMMAN 44			
COA	2	53.3	70.1
LOCKHEED 049			
BNF	2	76.7	65.6
CAP	11	51.2	31.9
TWA	32	60.9	59.5

*Includes DC-7B

[1] Interchange



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British patent 724.052
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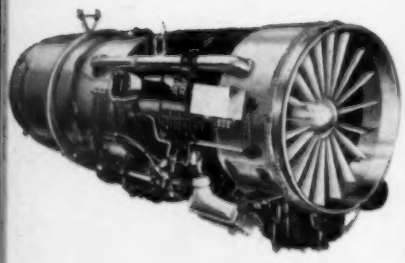
IN EARLY 1960, TCA WILL FLY THE FIRST ROLLS-ROYCE POWERED DC-8 IN THE WORLD!



This is the mighty Conway by-pass engine . . . pioneered by Rolls-Royce for civil aviation use. Other manufacturers are now designing their own "by-pass" or "turbo-fan" jet power plants.

For long range routes, TCA chose the Douglas DC-8 because of the many years of Douglas experience in commercial airframe construction. TCA selected the Conway "by-pass" engine for its reliability, power and economy.

The all-turbine fleet . . . all Rolls-Royce powered — TCA has selected the Vickers Vanguard, a large, fast turbo-prop transport for high density routes and will use the famous turbo-prop Vickers Viscount on shorter runs.

BY 1961 TRANS-CANADA AIR LINES WILL BECOME THE WORLD'S FIRST MAJOR INTERCONTINENTAL AIRLINE WITH AN ALL-TURBINE FLEET!

TCA

Circle No. 24 on Reader Service Card.

Airline	No. Aircraft	Load Factor %	% Rev. to Avail. Ton-Miles
LOCKHEED 749/749A			
EAL	17	51.7	50.7
PNA	4	53.3	63.2
TWA	39	59.9	53.1
LOCKHEED 1049			
EAL	12	54.6	55.6
LOCKHEED 1049A			
TWA	9	60.6	50.5
LOCKHEED 1049C			
EAL	16	50.3	42.6
LOCKHEED 1049G			
EAL	10	52.2	39.8
TWA	28	64.8	55.9
LOCKHEED 1049H			
FLT	14	...	...
NAL	4	64.4	61.1
TWA	9	48.7	49.4
LOCKHEED 1649A			
TWA	29	66.5	62.2
LOCKHEED LODESTAR			
NAL	7	59.5	44.3
MARTIN 202/404			
AAA	8	46.4	44.9
EAL*	56	52.7	55.6
PAC	8	54.5	51.3
TWA*	37	63.9	58.8
* Martin 404			
VICKERS VISCOUNT 745			
CAP	58	60.1	50.0
NEA	8	60.6	48.2
VICKERS VISCOUNT 812			
CAP	2	67.4	61.7
CAL	12	50.2	49.9
Helicopter Operations			
BELL 47			
CHA	3	...	34.3[1]
NYC	1	...	...
HILLER			
ACA	1	43.7	70.4
SIKORSKY S-51			
LAA	2	...	38.9
SIKORSKY S-55			
LAA	5	52.9	58.5
SIKORSKY S-58			
CHA	5	37.1	27.5
VERTOL 44B			
NYA	5	44.6	46.0

[1] Cargo Only

Source: Airlift Survey
Compilations: Ray & Ray

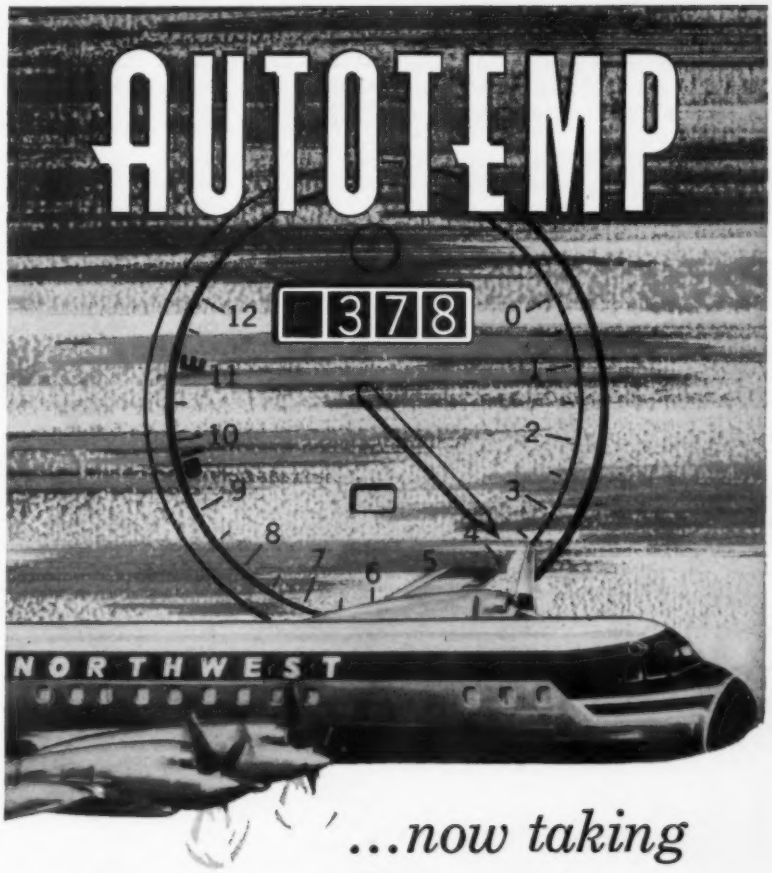
AIRLINE OPERATING COSTS

The Boeing 707 jet transport, during the first 66 days of operation by Pan American World Airways, rang up a direct operating cost of 202.0¢ per plane mile and a direct maintenance cost of $241.62 per revenue flight hour, an AIRLIFT survey reveals.

Although covering a limited time period, these statistics are the first for big jets in commercial service.

First direct operating costs reported by operators of Fairchild F-27 twin turboprops reveal a range from 72.5¢ to 102.6¢ per plane mile.

West Coast Airlines showed costs of 72.5¢, Northern Consolidated 81.3¢ and Piedmont 102.6¢ for an average



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Lockheed ELECTRA'S
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High accuracy, and easiest *needle pointer plus digital in-line counter readout,* are the principal service features of the BH183 AUTOTEMP® jet engine temperature indicator.

AUTOTEMP is designed and produced by the makers of the JETCAL Analyzer®, the only jet engine tester used throughout the world.

The AUTOTEMP is a completely new instrument...a continuous null balance 144-inch slidewire potentiometer combined with a linearizing analog-to-digital converter. Its accuracy is the simple attribute or phenomenon of its novel and basic slidewire potentiometer!

Completely self-contained...transistorized, miniaturized, hermetically sealed, servo-driven...the AUTOTEMP'S 3"-diameter case includes a Zener reference, power supply, amplifier, servo motor, cold junction compensation and the 144-inch slidewire and punched tape to linearize thermocouple e.m.f. for exact, counter-type digital readout. The needle pointer indicates in 50°C increments over the 0 to 1200°C full range of the unit.

Full information is contained in our Bulletin BH183 available for the asking!

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Circle No. 3 on Reader Service Card.

of 85.5¢ for the three operations.

In Viscount operations, Capital Airlines reported 1958 costs at 91.8¢ per plane-mile and Northeast 93.6¢. Costs at Continental for the larger Viscount 812 ran 74.5¢.

Among the new entries in helicopter operations was Vertol's 44B. It showed costs of 43.9¢ per helicopter mile in use by New York Airways.

Here's how carriers fared on direct operating costs by type of equipment:

Due to the varying methods employed by the different airlines, the carriers caution against using these figures for purposes of comparison.

Airline	(Cents per plane-mile) 1958	1957	1956
BOEING 707			
PAA	202.0	....	....
BOEING 377			
NWA	155.5	158.7	156.8
PAA-Atl	....	167.0	168.6
PAA	165.0	159.0	145.0
CONVAIR 240			
AA	66.0	67.0	64.0
MOH	101.3	94.0	99.9
NEA	97.0	114.0	95.9
WAL	78.0	79.0	69.2
CONVAIR 340/440			
BNF	72.4	78.4	70.6
CAL	87.2	88.0	72.9
DAL	81.2	83.8	71.9
DAL-F	83.7	....	....
EAL *	86.4	109.8	....
HAL	96.02	92.0	87.5
NAL	104.0	103.3	....
NAL-F	93.0	....	....
UAL	110.0	112.0	84.8
*Convair 440's only			
CURTISS C-46/CW 20 T			
ASA	118.0	145.0	....
ASA Int'l	49.3	62.2	....
BNF	84.2	78.5	65.6
DAL	85.9	107.2	....
RID	69.5	89.0	....
RID-F	75.0	76.0	....
F—Foreign or International			
DOUGLAS DC-3			
AAA	73.0	57.1	....
AAH	64.8	59.1	50.8
ASA	81.0	89.0	....
BAL	61.1	62.4	46.6
BNF	48.1	52.1	42.8
CAL	56.8	62.0	48.3
CAP	67.3	58.0	45.7
CBA	89.8	79.1	58.9
CEN	64.5	63.1	54.0
DAL	53.4	58.8	44.9
FAL	....	64.0	48.5
HAL	59.5	61.0	57.9
LCA	....	65.8	50.2
MAK	83.7	78.6	....
MOH	67.5	72.5	57.3
NCA	106.8	....	....
NEA	60.7	71.3	55.2
NOR	55.4	61.4	46.9
NWA	64.5	68.6	55.7
OZA	67.5	68.0	53.3
PAC	....	62.5	58.9
PAI	61.8	52.6	50.9
Panagra	122.0	....	....
PNA	80.0	81.0	....
SOU	63.9	61.0	47.1
TTA	58.8	58.2	....
WAL	50.0	60.0	48.9
WCA	44.1	60.0	48.7
WEN	116.5	....	....
DOUGLAS DC-4			
ASA	114.0	115.0	....
ASA Int'l	115.7	....	....
CAP	104.6	110.1	74.1
MAK	92.9	95.5	....
NWA	100.2	97.3	74.1
NWA-F	119.0	106.1	90.4
Panagra	118.5	....	....
PNA	89.0	115.0	....
RAL	89.0	85.0	....
RID	134.1	232.0	....
RID-F	104.8	99.0	....
TWA	98.8	87.2	90.3
TWA-F	196.2	136.1	....
DOUGLAS DC-6			
ASA	146.0	....	....
AA	86.0	86.0	80.0
AA-F	79.0	81.0	80.0
BNF	97.3	110.9	87.0
BNF-F	109.0	113.8	99.4
DAL	66.8	97.8	90.1
NAL	108.0	128.8	98.5
NAL-F	102.0	....	....
Panagra	248.2	....	....
UAL	105.0	111.0	82.2
UAL-F	85.0	....	....
DOUGLAS DC-6A			
AA	104.0	109.0	108.0
AA-F	101.0	117.0	119.0
UAL	128.0	111.0	114.1
DOUGLAS DC-6B			
AA	96.0	104.0	102.0
AA-F	88.0	97.0	103.0
CAL	122.0	....	....
EAL	135.4	135.5	....
EAL-F	124.0	....	....
NAL	123.0	132.5	108.0
NAL-F	100.0	....	....
NEA	102.7	106.8	....
NWA	130.4	127.8	121.0
NWA-F	127.4	132.6	121.6
PAA-LAT	157.0	129.0	....
Panagra	155.7	....	....
UAL	120.0	124.0	97.7
UAL-F	110.0	118.0	93.2
WAL	118.0	107.0	98.1
WAL-F	116.0	106.0	....
DOUGLAS DC-6C			
HAL	147.7	....	....
DOUGLAS DC-7/7B			
AA	130.0	130.0	123.0
AA-F	125.0	161.0	....
CAL	129.1	127.0	....
DAL	134.9	151.0	128.1
DAL-F	140.0	150.9	135.0
EAL	127.6	159.2	....
EAL-F	127.5	160.0	....
NAL	154.0	179.8	137.7
NAL-F	150.0	....	....
PAA	126.45	147.6	194.0
Panagra	188.5	....	....
UAL	133.0	134.0	114.6
UAL-F	136.0	141.0	122.8
DOUGLAS DC-7C			
BNF	116.0	125.8	....
BNF-F	131.0	137.8	....
NWA	143.2	129.7	....
NWA-F	156.9	144.3	....
PAA	133.0	179.0	....
FAIRCHILD F-27			
NCA	81.3	....	....
PAI	102.6	....	....
WCA	72.5	....	....
GRUMMAN 21A			
ACA	72.1	....	....
ES	67.8	....	....
REV	....	....	....
GRUMMAN 44			
COA	77.1	....	....
LOCKHEED LODESTAR			
NAL	99.0	66.7	....
NAL-F	182.0	....	....
LOCKHEED 49/049			
CAP	168.0	157.3	121.1
TWA	112.1	97.9	101.1
LOCKHEED 749/749A			
EAL	102.5	106.4	94.6
EAL-F	103.0	97.5	....
PNA	146.0	153.0	....
TWA	103.7	105.2	109.3
TWA-F	404.5	137.6	134.4
LOCKHEED 1049/1049A			
EAL	128.0	113.5	97.0
EAL-F	113.6	106.4	....
SWB	....	....	....
TWA	125.9	127.6	133.7
LOCKHEED 1049C			
EAL	110.8	147.2	154.6
EAL-F	106.5	140.4	146.4
LOCKHEED 1049G			
EAL	142.7	164.0	273.5
EAL-F	132.3	166.5	....
TWA	134.4	139.8	143.7
TWA-F	178.3	180.3	177.5
LOCKHEED 1049H			
FLT	....	....	....
NAL	149.0	105.6	....
NAL-F	157.0	....	....
TWA	210.3	379.2	....
TWA-F	187.7	210.2	....
LOCKHEED 1649A			
TWA	131.1	139.0	....
TWA-F	167.7	167.6	....
MARTIN 202			
AAA	102.0	84.8	....
PAC	....	62.1	81.7
MARTIN 404			
EAL	74.2	71.9	....
TWA	89.6	85.4	....
VICKERS VISCOUNT 744/745			
CAP	91.8	84.9	....
NEA	93.6	....	....
VICKERS VISCOUNT 812			
CAP	108.8	....	....
CAL	74.5	....	....
HELICOPTER OPERATIONS			
BELL-47			
CHA	721.0	....	....
NYC	248.0	271.0	....
HILLER			
ACA	251.7	....	....
SIKORSKY S-51			
LAA	760.0	390.0	....
SIKORSKY S-55			
LAA	121.0	126.0	....
NYA	....	215.0	....
SIKORSKY S-58			
CHA	353.0	....	....
VERTOL 44B			
NYA	439.0	....	....

Source: Airlift Survey.
Compilations: Ray & Ray

MAINTENANCE COSTS

Airline	(Dollars per flight hour) 1958	1957	1956
BOEING 707			
PAA	$241.62	.....	.....
BOEING 377			
NWA	$156.68	$174.22	$ 98.98
CONVAIR 240			
AA	$ 43.94	$ 32.61	$ 42.90
MOH	54.88	38.26	60.20
NEA	57.89	96.58	53.48
WAL	33.31	.....	.....
CONVAIR 340/440			
BNF	$ 31.15	$ 32.60	$ 36.77
CAL	45.91	60.90	36.76
DAL	35.84	50.61	34.44
EAL *	36.98	33.60	.....
HAL	47.12	40.73	37.90
NAL	64.21	63.34	37.24
UAL	65.61	75.71	39.12
* Convair 440's only			

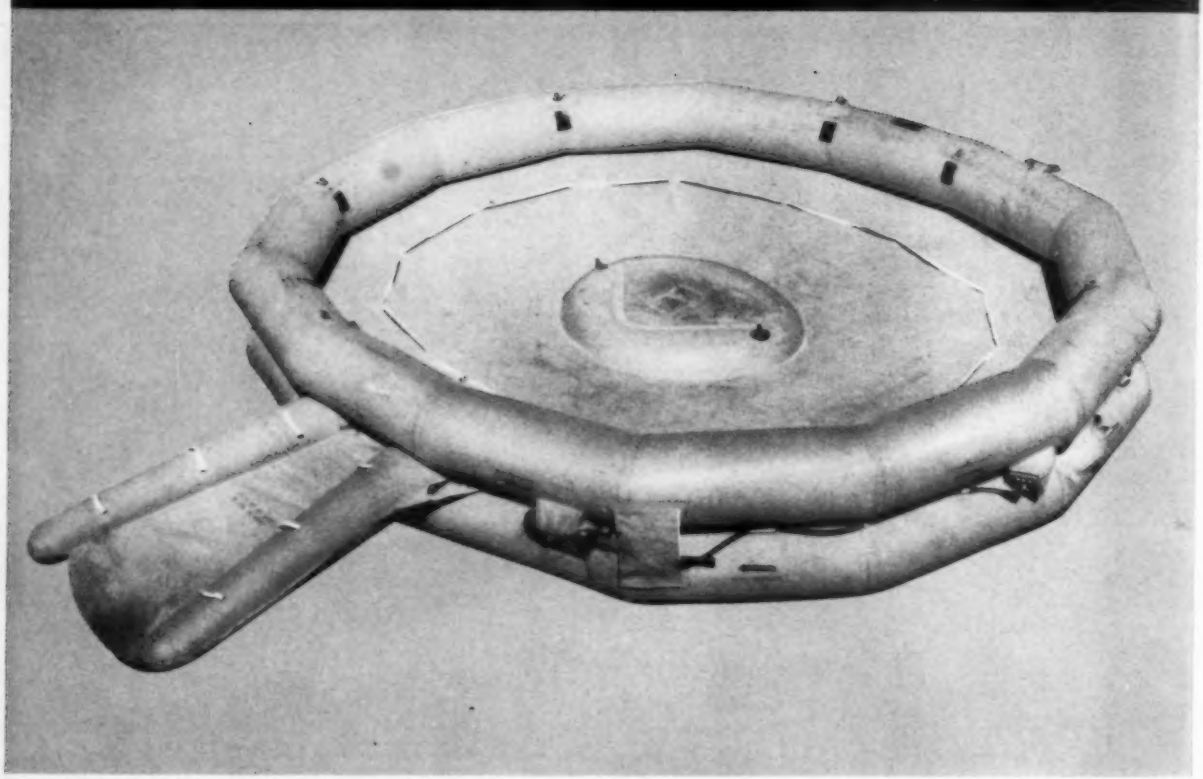
The Comet 4B in service on BEA routes in 1960

BRITISH EUROPEAN AIRWAYS
General Sales Agents in U.S.A. and CANADA: BOAC

BEA

Circle No. 18 on Reader Service Card.

INFLATABLE LIFE RAFT / another product of Air Cruisers research



NOW...
INFLATION IN 9 SECONDS!

A dramatically new development for survival at sea... Air Cruisers has developed a 25-man air-aspirated life raft which fully inflates in as little as 9 seconds.

Compressed air is injected through a jet air pump which utilizes the Venturi principle to induce a large inflow of atmospheric air inflating the life raft within seconds.

Other outstanding features of this airborne life raft include an easy-to-board ramp and a torus for floor support and integral accessory storage space at the center of the raft... plus full equipment for survival at sea.

The only manufacturer which conducts continuous research in survival equipment, Air Cruisers is America's most experienced fabricator of rubberized nylon materials for inflatables. These compact, lightweight inflatables minimize storage problems.

Your inquiries are invited.

THE GARRETT CORPORATION

AIR CRUISERS DIVISION

BELMAR, NEW JERSEY

LIFE JACKETS • LIFE RAFTS • HELICOPTER FLOATS • ESCAPE SLIDES • GAS BREATHER BAGS • DECELERATION BAGS

Circle No. 25 on Reader Service Card.

Airline	(Dollars per flight hour) 1958	1957	1956
CURTISS C-46			
ASA	$ 22.96	$ 60.27	.....
ASA Int'l	26.50	124.26	.....
BNF-C	44.11	36.10	$ 31.37
DAL	42.15	79.91	.....
RID	33.79	47.51	.....
WEN	78.02	.....	.....
DOUGLAS DC-3			
AAA	$ 21.43	$ 19.11	.....
AAH	19.89	33.98	$ 16.56
ASA	26.93	47.81	.....
BAL	34.33	32.07	16.77
BNF	17.25	18.24	16.32
CAL	15.69	28.07	15.49
CAP	31.94	28.37	16.43
CBA	55.91	50.04	29.26
CEN	33.87	91.31	18.66
COA	59.50	.....	.....
DAL	19.60	32.80	17.98
MAK	40.04	31.12	.....
MOH	22.74	23.26	20.50
NCA	32.45	.....	.....
NEA	25.30	39.05	19.20
NOR	20.28	29.85	18.07
NWA	28.54	34.47	23.00
OZA	24.98	18.80	21.31
PAC	.....	N/A	.....
PAI	32.00	17.93	19.04
Panagra	64.14	N/A	.....
PNA	39.97	42.46	.....
SOU	33.84	32.29	16.05
TTA	26.30	25.41	18.83
WAL	9.89	17.80	21.51
WCA	18.91	22.20	13.30
WEN	62.87	.....	.....
DOUGLAS DC-4			
ASA	$ 48.02	$ 57.71	.....
ASA Int'l	79.23	.....	.....
CAP	77.84	72.41	$ 42.49
MAK	61.84	61.98	.....
NWA	75.21	74.22	41.97
Panagra	104.88	.....	.....
PNA	44.63	90.53	.....
RAL	59.41	67.75	.....
RID	58.02	63.14	.....
TWA-C	.....	54.81	60.54
DOUGLAS DC-6			
ASA	$ 75.68	.....	.....
AA	59.64	$ 45.93	$ 62.84
BNF	51.81	64.84	57.70
DAL	47.08	.....	.....
NAL	80.16	112.85	51.45
Panagra	330.93	.....	.....
UAL	105.11	125.05	55.04
DOUGLAS DC-6A			
AA	$ 55.21	$ 43.98	$ 44.42
UAL-C	90.85	112.89	60.48
DOUGLAS DC-6B			
AA	$ 57.04	$ 41.09	$ 62.18
EAL	38.68	33.03	.....
NAL	70.78	102.29	.....
NEA	46.99	56.87	.....
NWA	74.48	82.72	52.01
Panagra	122.05	.....	.....
TRC	.....	.....	.....
UAL	86.12	100.98	53.99
WAL	41.07	47.59	43.64
DOUGLAS DC-7			
AA	$ 84.51	$ 55.93	$ 94.63
DAL*	100.21	148.22	109.26
NAL*	96.02	185.79	103.13
UAL	130.70	132.44	80.30
* Includes DC-7B			
DOUGLAS DC-7B			
CAL	$ 87.09	$119.74	.....
EAL	72.57	85.56	$ 83.85
PAA	126.45	147.61	32.16
Panagra	.....	192.99	.....

Airline	(Dollars per flight hour) 1958	1957	1956
DOUGLAS DC-7C			
BNF	$ 83.81	$ 76.10	$ 27.53
NWA	115.21	82.43	.....
FAIRCHILD F-27			
NCA	$ 18.60	.....	.....
PAI	78.00	.....	.....
WCA	15.23	.....	.....
GRUMMAN 21A			
ACA	$ 36.29	.....	.....
ES	26.59	.....	.....
REV	.....	.....	.....
GRUMMAN 44			
COA	$ 29.13	.....	.....
LOCKHEED 049			
BNF	N/A	$102.31	$102.63
CAP	129.58	119.38	.....
TWA	62.04	68.58	87.79
LOCKHEED 749/749A			
EAL	$ 68.72	$ 73.14	$ 72.38
PNA	126.37	127.28	.....
TWA	64.14	61.95	70.94
LOCKHEED 1049			
EAL	$114.03	$ 81.66	$ 77.24
LOCKHEED 1049A			
TWA	$ 81.95	$ 75.90	$ 98.53
LOCKHEED 1049C			
EAL	$ 79.33	$ 81.64	$ 99.01
LOCKHEED 1049G			
EAL	$ 74.08	$ 68.56	$ 65.03
TWA	.....	92.50	107.90
LOCKHEED 1049H			
FLT	.....	.....	.....
NAL	$ 80.15	$ 25.48	.....
TWA	.....	100.44	.....
LOCKHEED 1649A			
TWA	.....	$ 59.48	.....
LOCKHEED LODESTAR			
NAL	$ 82.48	$ 45.78	.....
MARTIN 202/404			
AAA	$ 40.43	$ 33.82	.....
EAL*	42.92	38.50	.....
TWA*	35.15	36.31	$ 49.99
* Martin 404			
VICKERS VISCOUNT 745			
CAP	$ 75.53	$ 57.09	$ 34.55
NEA	29.95	.....	.....
VICKERS VISCOUNT 812			
CAP	$ 74.28	.....	.....
CAL	39.07	.....	.....

Helicopter Operations

BELL 47			
CHA	$ 13.34	N/A	$ 15.25
NYC	56.78	$ 30.24	28.50
HILLER			
ACA	$100.95	.....	.....
SIKORSKY S-51			
LAA	$191.91	$ 47.22	$ 23.62
SIKORSKY S-55			
LAA	$ 45.58	$ 30.92	.....
SIKORSKY S-58			
CHA	$ 47.00	N/A	.....
VERTOL 44B			
NYA	$ 82.55	.....	.....

Aircraft Utilization—1958

Airline	Hrs./Day
Boeing 377	
PAA	9:06
PAA-C	10:30
NWA	7:35
C-Cargo	
Boeing 707	
NAL	6:42
PAA	6:54
Convair 240	
AA	6:55
MOH	4:17
NEA	4:56
WAL	6:36
Convair 340/440	
BNF	7:33
CAL	6:27
DAL	7:18
EAL	8:38
HAL	4:15
NAL	6:29
UAL	5:00
Curtiss C-46	
AAX	6:19
ASA	1:51
ASA—Int'l	5:12
BNF	5:01
DAL	4:49
RID	5:13
RID—Int'l	7:10
WEN	4:24
Douglas DC-3	
AAA	5:44
AAH	3:40
ASA	2:19
BAL	7:20
BNF	5:01
CAL	6:48
CAP	6:01
CBA	4:22
CEN	5:16
DAL	5:14
DAL-C	1:09
FAL	7:14
HAL	2:53
HAL-C	4:16
LCA	6:00
MAK	2:43
MOH	5:02
NCA	3:36
NEA	6:23
NOR	7:32
NWA	7:20
OZA	5:36
PAC	4:41
PAI	6:48
Panagra	1:42
PNA	3:18
SOU	5:27
TTA	5:24
WAL	5:55
WCA	5:23
WEN	3:36
Douglas DC-4	
ASA	5:33
ASA—Int'l	6:06
CAP	6:12
MAK	2:54
NWA	7:17
PAA	7:06
Panagra	4:26
PNA	3:42
RAL	9:36
RID	4:05
TRC	2:58
TWA-C	3:57
C-Cargo	
Douglas DC-6	
ASA	8:22
AA	8:07
BNF	9:03
DAL	8:58
NAL	8:31
PAA	5:00
Panagra	2:24
UAL	8:12
UAL—Int'l	11:30

Airline	Hrs./Day
Douglas DC-6A	
AA	7:43
PAA	9:12
PAA-C	10:36
UAL-C	7:00
C-Cargo	
Douglas DC-6B	
AA	8:13
CAL	5:57
EAL	9:05
NAL	9:03
NEA	9:44
NWA	8:07
PAA	8:00
Panagra	8:16
TRC	9:14
UAL	7:54
UAL—Int'l	10:12
WAL	8:17
WAL—Int'l	11:23
Douglas DC-7	
AA	8:38
DAL*	9:04
NAL*	8:08
UAL	9:30
*Includes DC-7B	
Douglas DC-7B	
CAL	8:23
PAA	8:24
Panagra	7:29
Douglas DC-7C	
NWA	9:14
PAA	10:42
Fairchild F-27	
NCA	2:45
PAI	5:06
WCA	4:33
Grumman G-21	
ACA	1:59
ES	1:57
Lockheed 049	
CAP	4:31
TWA	8:39
Lockheed 749/749A	
TWA	6:17
Lockheed 1049A	
TWA	7:51
Lockheed 1049G	
EAL	9:08
TWA	9:57
Lockheed 1049H	
NAL	8:03
TWA	5:55
TWA—Int'l	9:07
Lockheed 1649	
TWA	9:59
Lockheed Lodestar	
NAL	1:24
Martin 2-0-2/4-0-4	
AAA	4:31
EAL	8:06
PAC	5:22
TWA	5:09
Vickers Viscount 745	
CAP	7:54
NEA	6:03
Vickers Viscount 812	
CAP	6:37
CAL	7:07
HELICOPTER OPERATIONS	
Bell 47	
CHA	3:19
NYA	0:37
Hiller	
ACA	0:55

Airline	Hrs./Day
Sikorsky S-55	
LAA	4:42
Sikorsky S-58	
CHA	3:05
Vertol 44B	
NYA	3:41

ATC Slows Down the Big Jets

The 600-mph Boeing 707 has an average airline speed of 472 mph. Sounds impossible, but this is what's left after such delaying factors as ATC, slower speed climb, IFR maneuverings, etc. eat away at its quoted cruise figure.

At least that was the experience of Pan American World Airways in some 1,647 hrs. of 707 flying between Oct. 26 and the year end.

At National Airlines, 707s leased from PAA averaged somewhat less (446 mph) in nonstop New York-to-Miami operations. Although NAL flew only 174 hrs. from start of service Dec. 10 to Dec. 31, the average is representative of what is to be expected until ATC routings for jets can be improved.

Here's how various airlines fared with respect to specific type of equipment during 1958:

Airline	Revenue Flight Hours	Revenue Miles	Average Speed
BOEING 377			
PAA	78,008	19,809,295	254
NWA	23,954	5,819,615	243
BOEING 707			
NAL	174	77,603	446
PAA	1,647	777,645	472
CONVAIR 240			
AA	131,722	24,964,372	190
MOH	17,014	2,970,374	175
NEA	9,985	1,855,047	186
WAL	12,037	2,452,388	204
CONVAIR 340/440			
BNF	86,638	18,097,478	209
CAL	19,668	4,011,156	204
DAL	73,689	14,793,618	201
EAL*	53,504	10,137,707	189
HAL	7,772	1,480,890	192
NAL	42,578	7,925,610	186
UAL	97,189	18,517,793	191
* Convair 440's Only			
CURTISS C-46			
AAX	45,769	8,574,259	187
ASA	2,019	348,365	173
ASA Int'l	7,196	1,420,627	197
BNF-C	2,466	464,891	189
DAL	8,711	1,559,574	179
RID	57,986	10,983,289	189
WEN	5,971	1,081,809	181
DOUGLAS DC-3			
AAA	31,075	4,187,000	135
AAH	10,720	1,579,080	147
ASA	853	124,361	146
BAL	26,751	4,046,641	151
BNF	39,806	6,223,177	156
CAL	29,223	4,525,818	155
CAP	39,416	5,306,542	135
CBA	7,713	1,064,057	138
CEN	25,286	3,731,764	148
COA	2,442	286,559	117
DAL	20,218	2,940,299	145
DAL-C	835	127,400	153
FAL	41,283	6,181,162	150
HAL	9,418	1,438,114	153
LCA	21,887	3,064,414	140
MAK	1,986	278,498	140
MOH	15,886	2,069,398	130
NCA	5,373	804,058	150
NEA	25,635	3,511,012	137
NOR	76,571	10,914,306	143
NWA	8,915	1,250,396	140
OZA	45,003	6,351,562	141
PAC	18,800	2,628,464	140
PAI	52,438	7,656,734	146
Panagra	2,477	396,739	160
PNA	4,887	702,886	144
SOU	27,854	4,076,250	146
TTA	39,109	6,162,520	158
WAL	3,135	466,934	149
WCA	27,522	3,730,176	136
WEN	2,555	384,217	150
DOUGLAS DC-4			
ASA	4,751	931,999	196
ASA Int'l	1,214	258,027	213
CAP	27,142	4,468,709	165
MAK	3,213	626,339	195
NWA	31,266	5,720,820	183
PAA	59,450	11,687,367	197
Panagra	2,635	527,952	200
PNA	2,584	501,681	194
RAL	31,630	5,926,663	187
RID	4,163	839,310	202
TRC	906	179,491	198
TWA-C	8,671	1,622,087	187
UMCA	.....	.....	...
DOUGLAS DC-6			
ASA	3,355	867,509	259
AA	136,598	32,626,488	239
BNF	30,581	7,692,990	252
DAL	30,456	7,290,885	239
NAL	10,744	2,657,757	247
Panagra	158	41,937	265
UAL	125,505	31,057,368	247
DOUGLAS DC-6A			
AA	27,247	6,727,041	247
PAA	10,422	2,653,489	255
UAL-C	14,645	3,700,122	253
DOUGLAS DC-6B			
AA	70,701	17,141,203	242
CAL	6,626	1,654,718	250
EAL	20,535	4,925,425	240
HAL*	1,493	388,085	260
NAL	26,261	6,359,887	242
NEA	35,509	8,709,493	245
NWA	56,714	14,143,038	249
PAA	128,506	32,037,216	249
Panagra	7,687	1,968,762	256
TRC	5,505	1,396,811	254
UAL	114,379	28,698,896	251
WAL	57,185	13,529,506	237
* DC-6C			
DOUGLAS DC-7			
AA	178,064	52,951,368	297
DAL*	61,787	17,317,318	280
NAL*	27,206	7,473,577	275
UAL	177,462	53,542,523	302
* Includes DC-7B			
DOUGLAS DC-7B			
CAL	10,870	3,170,688	292
EAL	133,746	37,036,242	277
PAA	25,582	7,459,467	292
Panagra	9,198	2,673,719	291
DOUGLAS DC-7C			
BNF	21,179	6,082,956	287
NWA	43,617	12,591,460	289
PAA	100,312	28,181,432	281

Airline	Revenue Flight Hours	Revenue Miles	Average Speed
FAIRCHILD F-27			
NCA	85	18,721	220
PAI	744	150,432	202
WCA	2,108	373,926	177
GRUMMAN 21A			
ES	5,164	628,492	122
GRUMMAN 44			
COA	623	59,037	95
LOCKHEED 049			
BNF	221	50,203	227
CAP	17,909	3,723,314	208
TWA	90,142	20,624,864	229
LOCKHEED 749/749A			
EAL	48,015	10,748,599	224
PNA	11,144	2,802,523	251
TWA	84,024	19,405,607	231
LOCKHEED 1049			
EAL	35,478	8,715,101	246
LOCKHEED 1049A			
TWA	24,668	6,321,225	256
LOCKHEED 1049C			
EAL	48,209	12,136,003	252
LOCKHEED 1049G			
EAL	31,005	7,692,768	248
TWA	96,068	25,809,588	269
LOCKHEED 1049H			
NAL	11,728	3,046,477	260
TWA	19,946	5,222,635	262
LOCKHEED 1649A			
TWA	92,134	25,790,271	280
LOCKHEED LODESTAR			
NAL	2,602	400,456	154
MARTIN 202/404			
AAA	12,777	2,155,728	169
EAL *	146,705	26,174,137	178
PAC	15,089	2,755,583	183
TWA *	68,329	12,557,058	184
* Martin 404			
VICKERS VISCOUNT 745			
CAP	167,179	42,234,855	253
NEA	4,388	1,004,107	229
VICKERS VISCOUNT 812			
CAP	238	65,542	275
CAL	12,202	3,371,670	276
HELICOPTER OPERATIONS			
BELL 47			
CHA	3,625	203,257	56
NYC	195	11,790	60
SIKORSKY S-55			
LAA	8,355	593,267	71
SIKORSKY S-58			
CHA	4,856	415,309	86
VERTOL 44B			
NYA	3,921	227,420	58

Source: AIRLIFT Survey
Compilation: Ray & Ray

FUEL/OIL ANALYSIS

Fuel and oil bills for the U.S. scheduled airlines reached an all time high of $313 million in 1958 as carriers purchased some 1.7 billion gallons of avgas and jet fuel and 21.7 million gallons of oil.

Turbine fuel purchases amounted to 93.8 million gallons and, assuming costs of $500,000 for Pan American, approached the $10 million mark.

Average kerosene costs per gallon, based on direct averaging of gallons and costs reported to CAB, show Northeast paid 9.7¢, Capital 10.1¢, Eastern 10.3¢ and Continental 10.7¢.

By way of comparison, the domestic airlines as a group paid an average 17.6¢ a gallon in buying some 1.1 billion gallons of aviation gasoline.

Here's how airlines reported fuel gallonage and costs to CAB:

1958 Fuel & Oil Consumption

	Gallons		Expense ($)	
TURBINE FUEL	Fuel	Oil	Fuel	Oil
Capital	78,615,981	19,401	7,966,830	232,364
Continental	6,176,749	60	660,957	13,218
Eastern	885,632	509	91,395	1,045
Northeast	2,342,794	495	228,040	5,122
Northern Consolidated	47,960	.....	5,824	[1]
Pan American	4,884,487	1,211	NA	NA
Piedmont	270,210	76	20,733	381
West Coast	657,755	189	79,717	2,494
Totals	93,881,568	21,941	9,053,496	254,624
AVGAS				
DOMESTIC				
American	224,592,933	3,381,304	41,405,201	1,282,789
Braniff	44,317,473	485,734	7,482,167	178,468
Capital	19,873,620	295,020	3,340,456	92,068
Continental	23,270,551	220,378	3,816,435	125,560
Delta	68,263,376	956,466	12,089,903	327,931
Eastern	203,972,280	2,845,257	35,336,543	1,005,840
National	45,749,601	561,667	7,050,159	186,003
Northeast	20,368,816	223,332	3,783,213	98,097
Northwest	59,210,021	804,918	10,074,058	288,164
TWA	175,889,405	2,061,524	29,512,679	673,970
United	220,217,673	3,396,191	40,233,806	1,205,750
Western	25,644,711	279,465	4,674,486	121,367
Totals	1,131,370,460	15,511,256	198,799,106	5,586,007
INTERNATIONAL				
American	5,977,097	90,117	1,106,231	32,155
Braniff	5,723,894	76,095	1,332,816	55,782
Delta	3,812,478	58,742	793,918	40,065
Eastern	20,885,267	297,240	3,720,362	107,521
Mackey	1,084,417	10,900	214,013	[1]
National	3,345,866	40,058	548,967	15,357
Northwest	17,078,928	245,788	3,826,531	147,414
Pan American				
Alaska	3,412,883	39,420	821,917	18,953
Atlantic	88,300,520	1,207,256	19,163,430	764,670
Latin America	61,430,805	804,149	12,066,294	363,726
Pacific	50,015,304	594,330	11,143,989	344,823
Panagra	9,825,641	146,748	2,653,295	128,889
Resort	6,868,171	68,150	1,335,362	[1]
Trans-Caribbean	2,578,771	36,097	656,942	[1]
TWA	49,784,167	648,914	11,290,093	401,188
United	9,442,846	147,444	1,778,166	52,330
Western	1,443,144	13,944	321,487	8,963
Totals	341,010,199	4,525,392	72,773,813	2,481,836
HELICOPTERS				
Chicago	634,891	6,213	128,968	[1]
Los Angeles	377,711	6,360	71,976	[1]
New York	630,967	11,022	NA	
Totals	1,643,569	23,595	200,944	
ALL CARGO				
Aaxico	7,716,727	94,504	1,514,920	[1]
Aerovias Sud	1,438,377	16,678	377,146	14,899
Flying Tigers	24,838,438	265,801	5,575,871	203,388
Riddle	10,218,987	131,798	2,222,958	70,367
Seaboard & Western	14,877,083	228,407	NA	NA
Slick	4,204,679	50,920	995,058	33,801
Totals	63,294,291	788,108	10,685,953	322,455
ALASKA AND TERRITORIAL				
Alaska Airlines	3,265,009	41,738	746,132	27,603
Alaska Coastal	523,061	6,928	146,838	[1]
Aloha (TPA)	1,073,248	14,350	192,027	8,559
Caribbean	767,564	7,966	165,372	[1]
Cordova	276,911	7,438	93,795	[1]
Ellis	275,424	2,909	79,290	[1]
Hawaiian	3,322,649	51,077	688,179	31,907
Northern Consolidated	808,191	9,247	336,347	[1]
Pacific Northern	6,170,548	72,866	1,256,055	37,959
Reeve	888,440	9,795	NA	NA
Wien Alaska	1,598,677	25,599	599,646	[1]
Totals	18,969,722	249,913	4,303,681	106,028
LOCAL SERVICE				
Allegheny	6,128,409	102,011	1,137,211	47,393
Bonanza	2,835,623	30,588	519,413	16,065
Central	2,715,827	38,435	479,108	22,410
Frontier	4,541,474	44,391	NA	NA
Lake Central	2,356,813	23,726	448,336	14,134
Mohawk	5,302,463	74,140	1,030,597	32,234
North Central	8,072,914	62,867	1,375,833	32,322
Ozark	4,322,293	36,816	789,467	17,628
Pacific[2]	5,259,542	61,307	NA	NA
Piedmont	5,621,219	60,096	954,705	27,873
Southern	2,933,734	37,651	530,443	18,046
Trans-Texas	3,982,478	58,368	637,576	26,215
West Coast	2,928,627	27,873	524,190	14,892
Totals	57,001,616	658,269	8,426,879	269,212

[1] Oil expense included in fuel. [2] Pacific gallonage estimated. Source: Ray & Ray.

45.7% INCREASE

IN FLIGHT OPERATIONS THIS YEAR!

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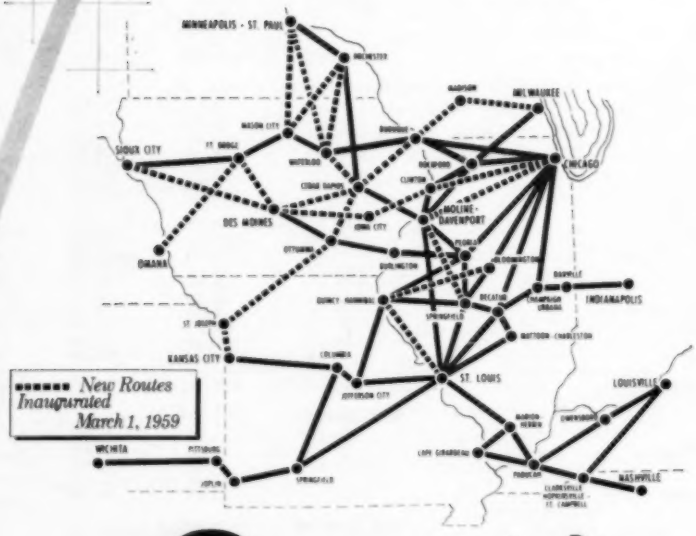

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ENGINE OVERHAUL

Significant time advances in the first turbine engine to be placed in service in the U.S. (Rolls-Royce Dart) spell promising days ahead for airline cost control specialists.

In the short span of four years since it entered service with Capital Airlines, the Rolls-Royce turboprop has moved consistently up to the threshold of the highest piston overhaul times. During 1958 Capital advanced its Darts another 300 hours, from 1,600 to 1,900. Northeast operates its at 1,700, Continental at 1,200 and both Piedmont and West Coast at 1,000 hours.

First appearance of the Allison 501 engine on airline engine rosters shows an overhaul time of 800 hours for American and 1,000 for Eastern. However, operation in both instances has been too brief to set an overhaul time extension in motion.

Another important newcomer is the Pratt & Whitney JT3, being operated 800 hours between overhaul by both Pan American and American.

In piston engine operation, a high of 2,225 hrs. was achieved by Eastern Air Lines with Wright 3350-BD1 engines. Close behind was United with a 2,200 hr. overhaul for Pratt & Whitney CB-16 engines installed in DC-6s. In Wright turbo compound, service overhaul periods range from a low of 1,000 hrs. to a high of 1,500.

Here's how airlines reported approved overhaul periods at the year end:

Airline	*Model*	*Time (Hrs.)*
	ALLISON 501	
AA	D-13	800
EAL	D-13	1,000
	CONTINENTAL 0470	
ACA	K	1,000
ES	K	800
	FRANKLIN 200	
CHA	C-32	600
	JACOBS	
ACA	L6MB	1,000
	LYCOMING 435	
NYA	AID	600
	P&W 985	
ACA	AN4	1,500
ES	AN1&3	1,300
LAA	B-4	1,100
	P&W 1340	
ASA	AN1	700
LAA	40	800
	P&W 1830	
AAA	92	1,300
AAH	92	1,400
ACA	92	1,000
ASA	92	1,000

Airline	Model	Time (Hrs.)
BAL	90D	1,200
BNF	92	1,350
CBA	S3C4G	1,050
CEN	90, 92	1,200
	P&W 1830	
FAL	S/C 3G	1,100
HAL	92	1,400
NEA	92	1,300
PAI	92	1,400
PNA	90-D	1,300
SOU	90-D	1,300
TTA	92	1,300
WAL	92	1,300
WCA	S3C4-G	1,450
	P&W 2000	
ASA	7M2	1,600
CAP	7M2	1,600
EAL	D-5	1,900
NWA	2SD13G	1,700
PNA	2S13G-D5	1,600
RAL	7M2	1,700
RID	7M2	1,450
SWB	7M2	1,600
TWA	9	1,600
	P&W 2800	
AA	34	1,700
AA	83AM7	2,000
AA	83AM7-CB16	1,900
AAA	77-CB16	1,300
ASA	75	1,100
ASA	CB17	1,300
BNF	CB16	1,700
BNF	83AM5	1,800
DAL	CB-16	1,700
DAL	CB-16	1,900
DAL	57	1,200
EAL	CB-3	1,700
EAL	CB-17	1,920
HAL	CB-17	1,500
HAL	CB-3	1,600
MOH	CA-3	1,400
NAL	CB-16/17	1,700
NEA	CB16	1,700
NWA	CB-16/17	1,900
PAA	CB-17	1,900
	P&W 2800	
RID	51-M1, 34	1,450
SWB	75M1	850
TWA	CB-16	1,700
UAL	CB-16 CV-340	1,700
UAL	CB-16 DC-6	2,200
UAL	CB-16 DC-6B	2,000
UAL	CB-17 DC-6A & BT	1,600
WAL	CB-16	1,700
WAL		1,900
	P&W 4360	
NWA	B-6/CB2	1,300
PAA	B-6	1,500
	P&W JT3	
AA	C6	800
PAA	C6	800
	ROLLS-ROYCE DART (Turbine)	
CAP	510	1,900
CAL	525	1,200
NEA	510	1,700
PAI	511	1,000
WLA	511	1,000
	WRIGHT 1820	
CAP	202A	1,600
CHA	HE2	600
DAL	202A	1,600
MOH	202A	1,400
NAL	G202A	1,450
NOR	202A	1,300
NYA	HE2	500
	WRIGHT 2600	
ACA	20	800
	WRIGHT 3350	
BNF	BA-3	1,000
CAP	BA-3	1,500
EAL	BD-1	2,225
EAL	CB-1	1,800
PNA	BD-1	2,000
TWA	BA-3	1,500
TWA	BD-1	2,100
TWA	CB-1	1,500
	WRIGHT TURBO COMPOUND	
AA	DA2-4	1,300
BNF	EA-1	1,200
CAL	DA4	1,300
DAL	DA2-4	1,300
EAL	DA-1	1,500
EAL	EA-3, DA-4, EA1	1,400
EAL	EA-4	1,300
NAL	DA	1,300
NWA	EA1-EA4	1,200
PAA	EA-1	1,200
PAA	DA-4	1,300
SWB	DA-3	1,400
TWA	DA-3	1,200
TWA	EA-3	1,000
TWA	EA-2	1,100
UAL	DA2-DA4	1,400

Source: Airlift Survey
Compilations: Ray & Ray

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AIRCRAFT SEATING

Airlines report a wide variety of seating arrangements for transports in service today. The influx of high-density layouts, interiors designed for two-class service, etc., have erased the fixed arrangements of the past.

The Douglas DC-3, for years a 21-passenger airplane, now averages 25 seats, hits a high of 31 in Hawaiian Airlines' operation. It still retains the original 21-place layout at Central, Ozark and Panagra.

The Boeing 707, although capable of extending cabin seating to new highs, is being operated by Pan American at a mixed luxury-class and tourist seating for 109 passengers. At this figure, it has only seven more seats than Douglas DC6B coach interior used by Eastern Air Lines.

Tabulated here are capacities by aircraft model as of December 31:

Airline	*No. of seats*	*No. of Aircraft*
	BOEING 377	
PAA	55*	23
NWA	83	9
*Average		
	BOEING 707	
PAA	109	6
	CONVAIR 240	
ALL	40	..
	CONVAIR 340	
BNF	44	31
CAL	44	8
DAL	37-44	28
EAL	44	20
HAL	52	..
UAL	44	52
	DOUGLAS DC-3	
AAA	24-26	15
AAH	28	8
BAL	28	10
BNF	24	19
CAL	24	10
CAP	24	18
CBA	30	5
CEN	21	14
DAL	25	10
FAL	24	17
HAL	31	6
LCA	26	10
MOH	24	8
NCA	28	4
NEA	24	11
NOR	26	32
OZA	21	24
PAC	28	11
PAI	24	21
Panagra	21	4
PNA	28	4
SOU	26	16
TTA	21-23	21
WAL	22	2
WEN	27	2
‡ Leased		
	DOUGLAS DC-4	
CAP	55	12
NWA	50-62	12
PAA	56	22
Panagra	46	2
PNA	50	1
	DOUGLAS DC-6	
AA	58	26
BNF	20-52*	10
DAL	76	7
Panagra	62	1
UAL	50-72	42
*Combination service		
	DOUGLAS DC-6B	
AA	66	21
CAL	65	3
EAL	102	7
NEA	74-76	10
NWA	50-76	21
PAA	66*	43
Panagra	75	4
UAL	58-75	41
WAL	60-66	21
–(C)	87	6
C-Coach	*Average	
	DOUGLAS DC-7	
AA	63-91	58
DAL	69-80	18
	90	3
UAL	54-86	55
	DOUGLAS DC-7B	
CAL	72	5
EAL	68	29
	93	19
PAA	58*	7
Panagra	58	5
*Average		
	DOUGLAS DC-7C	
BNF	62	6
NWA	55-79	14
PAA	66*	26
*Average		
	FAIRCHILD F-27	
NCA	40	2
PAI	36	4
WCA	40	6
	LOCKHEED 049	
BNF	54	2
CAP	56-72	11
TWA	81	32
	LOCKHEED ELECTRA	
EAL	70	9
	LOCKHEED 749/749A	
EAL	60	17
PNA	61	4
TWA	55	39
	LOCKHEED 1049	
EAL	88	12
	LOCKHEED 1049A	
TWA	64	9
	LOCKHEED 1049C	
EAL	88	16
	LOCKHEED 1049G	
EAL	70	10
TWA	57-65	28
	LOCKHEED 1649A	
TWA	59-63	29
	MARTIN 2-0-2/404	
AAA	36-44	8
EAL	40	56
PAC	44	8
TWA	40	37
	VICKERS VISCOUNT 745	
CAP	44	58
NEA	44	8
	VICKERS VISCOUNT 812	
CAP	52	2
CAL	52	12

1958 ACCIDENT RECORD

The safety record of the U.S. airlines, marred principally in 1958 by two major collisions with military aircraft, still proved air transportation is one of the safest if not the safest form of transportation.

For the seventh year in succession, combined domestic and international operations recorded a fatality rate of less than one per 100 million passenger miles; 0.4 for domestic and only 0.2 for international, to be exact.

The two collisions, one at Las Vegas and another at Brunswick, Md., accounted for 58 of the year's total of 139 fatalities. Poor pilot judgment in two others, Northeast at Nantucket and Braniff at Miami, accounted for 33 fatalities.

In another, after more than a year of study, CAB blamed an unanticipated stall during a steep turn as the cause of Capital Airlines' Viscount accident on an approach at Saginaw, Mich.

Date	Location	Pass. & Crew Fatalities	Remarks-Findings
Domestic			
4/6	Saginaw, Mich.	47	Capital Viscount stalled on approach during steep turn in gusty weather.
4/21	Las Vegas, Nev.	47	Collision, United DC-7 and USAF F-100. Resulted from high rate of near head-on closure; also failure of Nellis AFB and CAA to take every measure to reduce known collision exposure.
5/20	Brunswick, Md.	11	Collision, Capital Viscount and Air National Guard T-33. Resulted from failure of ANG pilot to exercise proper and adequate vigilance.
8/15	Nantucket, Mass.	24	Northeast Convair on approach. Deficient judgment and technique of pilot during ILS approach in failure to abandon approach when visibility reported at 1/8 mile.
International			
3/25	Miami, Fla.	9	Braniff DC-7. Failure of pilot to maintain altitude during emergency return to airport after engine fire during takeoff.
6/2	Manila, Philippines	1	Pan American 377 on approach. No published report (Circumstantial). Propeller failed, blade penetrated cabin causing one passenger fatality.

AIRLINES REPORT EXECUTIVE SALARIES

Annual reports of 1958 salaries of officers of the following airlines have been filed with the Civil Aeronautics Board. These figures are taken from the Schedule G-42 reports. Figures given are salaries unless otherwise stated. Where date of entry into office is shown, the salary covers the period beginning at that time.

AMERICAN AIRLINES

OFFICERS: **C. R. Smith**, pres., $85,000; **Wm. J. Hogan**, exec. v.p.-fin., $70,000; **O. M. Mosier**, exec. v.p.-opr., $70,000; **C. A. Rheinstrom**, exec. v.p.-sales (4-1-58*), $52,500; **C. W. Jacob**, sr. v.p. & secy., $65,000; **C. R. Speers**, sr. v.p.-sales, $55,000; **T. L. Boyd**, v.p., $30,000; **G. J. Brandewiede**, v.p., $32,500; **S. C. Dunlap**, v.p., $25,000; **L. E. Glasgow**, v.p. & cont., $36,667; **P. W. Kayser**, v.p., $40,000; **W. Littlewood**, v.p., $35,000; **W. Player**, v.p., $36,667; **G. M. Sadler**, v.p., $25,000; **N. L. Smith**, v.p., $30,000; **E. C. Taylor**, v.p., $33,056; **G. C. Van Nostrand**, v.p., $40,583; **M. Whitlock**, v.p., $27,500; **P. G. Larie**, treas., $24,000; **M. G. Beard**, asst. v.p., $24,000; **J. V. Dooley**, asst. v.p., $21,222; **R. A. Goebel**, asst. v.p., $24,028; **W. B. Hickman**, asst. v.p., $22,500; **W. G. Hobbs**, asst. v.p. (5-21-58*) $17,020; **T. F. Holder**, asst. v.p., $18,000; **J. D. Hungerford**, asst. v.p., $21,528; **W. C. Lawrence**, asst. v.p., $25,000; **D. F. O'Donoghue**, asst. v.p., $26,528; **H. D. Reynolds**, asst. v.p. (9-17-58*), $9,338; **M. L. Rinehart**, asst. v.p. & asst. treas., $28,500; **M. W. Shipley**, Asst. v.p., $22,000; **A. E. Smick**, asst. v.p., $22,222; **C. H. Startup**, asst. v.p., $20,000; **D. D. Taylor**, asst. v.p. (5-21-58*), $20,420; **W. G. Whitney**, asst. v.p., $24,000; **F. C. Wiser**, asst. v.p., $24,792; **V. J. Long**, asst. cont. & asst. secy., $22,000; **C. N. Oursler**, asst. cont., $28,500; **W. J. Corbett**, asst. treas. & asst. secy., $18,500; **A. A. Paradis**, asst. secy., $17,111; **A. R. Bone**, reg. v.p., $32,500; **W. N. Bump**, reg. v.p., $32,500; **R. L. Fitzpatrick**, reg. v.p., $23,333; **S. G. King**, reg. v.p., $27,500; **H. J. Lyall**, reg. v.p., $22,396.

*—Date entered office.

TRANS WORLD AIRLINES

OFFICERS: **Charles S. Thomas**, pres.[1] $27,175; **Warren Lee Pierson**, chm. of board & dir., $62,467; **E. O. Cocke**, sr. v.p.-sales & dir., $33,700; **A. V. Leslie**, sr. v.p.-finance, treas., $33,700; **George Betts**, v.p.-purchasing, $21,280; **F. E. Busch**, v.p.-**H. Clay**, v.p.-adm. svcs. & dir.[2], $4,603; **F. G.** operations, $29,864; **J. H. Clemson**, v.p., $24,111; **P. G. Desautels**, v.p.-pass. serv., $24,111; **R. M. Dunn**, v.p.-o'haul & maint. & stores, $20,806; **C. S. Fullerton**, v.p. & gen. sales mgr., $23,647; **G. L. Gilmore**, v.p.-pub. rel., $19,316; **C. E. McCollum**, v.p.-national accounts, $18,664; **R. W. Rummel**, v.p.-engr., $19,258; **T. K. Taylor**, v.p., $23,244; **J. W. Thomas**, v.p.-civic affairs, $18,045; **J. D. Harrigan**, v.p.-reg. sales, $15,642; **J. W. Letzkus**, v.p.-reg. sales, $19,002; **L. P. Marechal**, v.p.-reg. sales, $16,881; **R. Mazzarrini**, v.p.-reg. sales, $16,598; **R. E. Montgomery**, v.p.-reg. sales, $19,720; **A. L. Stewart**, v.p.-reg. sales[3], $4,177; **E. W. Barker**, asst. secy., $13,499; **R. Duckworth**, corporate secy., $16,440; and **W. E. Rooker**, asst. treas. $16,328.

NOTES: [1] Elected president 7-15-58.
[2] Resigned as v.p.-adm. serv. 1-31-58.
[3] Retired 2-28-58.

UNITED AIR LINES

OFFICERS: **W. A. Patterson**, pres., $100,000; **R. E. Johnson**, sr. v.p.-sales & pub. rel., $50,000; **J. A. Herlihy**, sr. v.p.-engrg. & mntce., $50,000; **D. F. Magarrell**, sr. v.p. trnsp. serv., $50,000; **D. R. Patty**, sr. v.p.-flight oper., $48,000; **Curtis Barkes**, sr. v.p.-fin. & prop., $50,000; **R. F. Ahrens**, sr. v.p.-personnel, $39,000; **Hal E. Nourse**, sr. v.p.-econ. controls, $32,000; **C. F. McErlean**, v.p.-asst. to pres., $32,000; **S. P. Martin**, secy. of corps. & asst. to pres., $20,000; **Rexford E. Bruno**, compt. & asst. secy., $24,000; **A. M. deYoursney**, v.p. & treas., $25,000; **R. M. Ruddick**, v.p.-asst. to pres. (1-30-58*), $17,600; **J. E. Moore**, v.p.-asst. to pres. (1-30-58*), $24,000; **W. C. Mentzer**, v.p.-engrg. & mntce. (1-30-58*), $30,500; **W. P. Hoare**, v.p.-mntce., (1-30-58*), $26,000; **O. T. Larson**, v.p.-grnd. services (1-30-58*), $28,000; **O. C. Enge**, v.p.-psgr. service, (1-30-58*), $24,000; **I. E. Sommermeyer**, v.p.-flying (1-30-58*), $28,000; **J. M. Hodgson**, v.p.-flt. adm. (1-30-58*), $25,900; **B. B. Gragg**, v.p.-marketing (1-30-58*), $27,400; **H. J. Merchant**, v.p.-sales mgr. (1-30-58*), $24,000; **D. V. O'Leary**, v.p.-purch. & stores (1-30-58*), $24,000; **D. C. Meenan**, v.p.-facil. & prop., (1-30-58*), 19,000; **C. M. Mason**, v.p.-empl. rel. (1-30-58*), $23,600; **T. Lee, Jr.**, v.p.-educ. & trng. (1-30-58*), $15,500; **L. F. Hampel**, v.p.-bus. research (1-30-58*), $19,200; and **W. E. Alberts**, v.p.-indus. engrg. (1-30-58*), $18,500.

NOTES: *—Date entered office.

EASTERN AIR LINES

OFFICERS: **E. V. Rickenbacker**, chrm. of board, gen. mgr. $47,396; $1,000 bonus & indir.; **T. F. Armstrong**, pres. & dir., $34,089; $1,000 bonus & indir.; **S. L. Shannon**, sr. v.p. & dir., $29,219; $1,000 bonus & indir.; **T. E. Creighton**, treas. & dir., $17,045; $1,000 bonus & indir.; **L. P. Arnold**, v.p., $21,915; **M. M. Frost**, v.p., $26,784; **William Van Dusen**, v.p., $24,349; **Charles Froesch**, v.p., $18,334; **J. H. Brock**, v.p., $19,480; **Robert Ramspeck**, v.p., $19,480; **W. L. Morrisette**, v.p., $18,334; **J. H. Halliburton**, v.p. (4-11-58*), $15,315 salary, 472 shares; **B. T. Dykes**, v.p., $28,830; **G. A. Smith**, 2d v.p., $19,480; **R. S. Lipp**, secy., $9,591; **M. Lethbridge**, asst. v.p. 5-23-58*), $8,178; **M. B. Westphal**, asst. v.p. (5-23-58*), $9,095; **Frank Sharpe**, asst. v.p. (5-23-58*), $9,325; **A. L. Chabot**, asst. v.p. (5-23-58*), $11,511; **D. C. McRae**, asst. v.p. (6-27-58*), $6,840; **F. E. Williams**, asst. v.p. (5-23-58*), $6,578; **M. O. Byrd**, asst. v.p. (5-23-58*), $6,848; **Graydon Hall**, asst. v.p. (6-27-58*), $4,047; **E. L. Williams**, asst. v.p., (5-23-58*), $5,804; **D. L. Sinkler**, asst. v.p. (5-23-58*), $6,578; **H. W. Cutshall**, asst. v.p. (5-23-58*), $5,804; **A. F. Tirrell**, asst. v.p. (5-23-58*), $5,819; **J. E. Reinke**, asst. v.p. (5-23-58*), $8,126; **H. G. Dobbs**, asst. v.p. (5-23-58*), $6,965; **F. A. Bennett**, asst. v.p. (6-27-58*), $4,419; **R. E. Baskind**, asst. v.p. (8-18-58*), $4,023; **G. W. Channel**, asst. v.p., $12,537; **C. A. Glover**, asst. v.p. (4-11-58*), $6,064 salary, 235 shares; **Beverly Griffith**, asst. v.p. (6-27-58*), $4,047; **J. A. Hamill**, asst. v.p. (5-23-58*), $5,359; **Harrison Knapp**, asst. v.p. (4-11-58*), $8,070; **W. T. Raymond**, asst. v.p. (5-23-58*), $8,706; **T. A. Sundem**, asst. v.p. (6-27-58*), $4,624; **E. E. Hahn**, asst. treas., $10,104; **C. J. Simons**, asst. treas., $9,811; **J. G. Warlick**, asst. secy., $9,740; and **G. A. Wallen**, asst. secy., $9,591; **P. H. Brattain**, $12,000 advisory fees.

NOTES: *—Date entered office.
**—Includes $12,000 paid under advisory contract.

NORTHWEST AIRLINES

OFFICERS: **Croil Hunter**, chm. of board, $35,417; **Donald W. Nyrop**, pres., $67,333; **Malcolm S. Mackay**, exec. v.p., $30,000; **Frank C. Judd**, v.p.-

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operations & engr., $28,958; **Gordon M. Bain**, v.p.-sales, $28,958; **Linus C. Glotzbach**, v.p.-personnel, $23,000; **A. E. Floan**, v.p. & secy., $22,000; **William J. Eiden**, treas., $23,958; **Alroy D. Piepgras**, asst. comptroller, $12,583; **Donald H. Hardesty**, asst. treas., $12,875; **Dale Merrick**, asst. v.p.-properties, $13,583; **C. L. Stewart**, v.p.-plans, $17,375; **Paul L. Benscoter**, v.p.-Orient region, $18,575; **Frank J. Scott**, asst. secy., $11,417; **Phillip T. Drotning**, v.p.-pub. rel., $18,875; and **Leonard S. Holstad**, comptroller (resigned 1/31/58), $1,667.

NATIONAL AIRLINES

OFFICERS: **G. T. Baker**, pres., $48,000, $18,273 expenses; **J. C. Brawner**, sr. v.p., $24,000, $2,678 expenses; **W. B. Caldwell, Jr.**, asst. treas., $12,000, $698 expenses; **L. W. Dymond**, v.p., $20,000, $727 expenses; **R. A. Fitzgerald**, v.p., $15,000, $329 expenses; **R. P. Foreman**, secy. & dir., $15,000, $1,133 expenses; **R. S. Grant**, asst. v.p., $15,000; **A. G. Hardy**, sr. v.p., $24,000, $2,197 expenses; **W. F. Johnson**, asst. secy. & asst. treas., $15,000, $680 expenses; **John L. Morris**, v.p., $15,000, $3,696 expenses; **G. W. Paul**, asst. v.p., $12,000, $31 expenses; **W. A. Perry**, asst. v.p., $12,625, $1,017 expenses; **H. K. Pike**, v.p. (2-21-58†), $2,188; **J. M. Rosenthal**, sr. v.p., $24,000, $2,029 expenses; **C. F. Sharp**, asst. v.p., $14,375, $1,511 expenses; **W. Sternberg**, sr. v.p., $24,000, $4,564 expenses; and **R. E. Wieland**, v.p., $15,000, $1,622 expenses.
NOTES: *—Date entered office. †—Term expired.

CAPITAL AIRLINES

OFFICERS: **J. H. Carmichael**, chrm. of board[1], $33,667; **David H. Baker**, pres., $59,517; **R. G. Lochiel**, sr. v.p., treas. & dir., $32,734; **W. H. Johnson**, sr. v.p. (9/1/58*), $13,011; **J. B. Franklin**, v.p., $28,370; **R. J. Wilson**, v.p., $24,278; **Hayes Dever**, v.p. & secy., $19,095; **Read Q. Chalfant**, asst. v.p. (3/18/58*), $16,071; **S. B. Goldthorpe**, asst. v.p. & comptroller, $17,359; **R. W. Hardesty**, asst. v.p., $18,549; **S. T. McAlister**, asst. v.p., $15,177; **Waller B. Smith**, asst. secy., $9,678; **R. P. Wright**, asst. treas., $16,070; and **O'Ferrall Estes**, asst. treas., $14,879.
NOTES: *—Date entered office.
[1]—Resigned 7/22/58.

BRANIFF AIRWAYS

OFFICERS: **Charles E. Beard**, pres., $72,000, $5,265 bonus & indir., $4,218 expenses; **J. W. Miller**, exec. v.p., $46,000, $1,381 bonus & indir., $1,482 expenses; **C. G. Adams**, v.p.-fin. & secy., $33,000, $1,170 bonus & indir., $1,097 expenses; **R. C. Shrader**, v.p., $18,000, $1,215 bonus & indir.; **R. V. Carlton**, v.p.-operations, $36,000, $2,565 bonus & indir., $1,527 expenses; **Rex Brack**, v.p.-traffic & sales, $24,000, $1,665 bonus & indir., $5,205 expenses; **Malcolm Harrison**, v.p.-industrial rel., $20,000, $1,365 bonus & indir., $866 expenses; **Walter Henshel**, v.p.-pub. rel., $20,000, $1,365 bonus & indir., $917 expenses; **V. A. Kropff**, asst. v.p.-exec. projects, $13,200, $855 bonus & indir., $648 expenses; **O. W. Crane**, treas., $14,869, $980 bonus & indir., $226 expenses; **R. L. Barrier**, asst. treas.-budget dir., $11,850, $754 bonus & indir., $75 expenses; **F. J. Beisecker**, asst. treas., $11,850, $143 expenses; **Loyd Eden**, asst. treas., $11,850, $754 bonus & indir., $158 expenses; **Velta Bowlware**, asst. secy., $5,100, $248 bonus and indir.; **Tom Robertson**, asst. v.p.-research & statistics, $10,725, $669 bonus & indir., $666 expenses; **Horace Bolding**, v.p.-purchasing & stores, $14,250, $934 bonus & indir., $174 expenses; and **Charles S. South**, v.p., $17,387, $1,169 bonus & indir., $3,759 expenses.

CONTINENTAL AIR LINES

OFFICERS: **Louis H. Mueller**, chm. of board, $400 bonus & indir.; **Robert F. Six**, pres., $53,167; **Harding L. Lawrence**, exec. v.p., $19,958; **Joseph A. Uhl**, v.p.-finance, $21,267; **Harrold W. Bell, Jr.**, v.p.-personnel (4/28/58*), $8,000; **Charles H. Calhoun**, v.p.-engr. & maint.; **Marvin L. Davis**, v.p.-sales (4/28/58*), $9,436; **L. H. Dennis**, v.p.-pass. service, $17,883; **Stanley O. Halberg**, v.p.-pub. rel. & adv., $14,017; **O. R. Haueter**, v.p.-operations, $24,167; **Chris F. Whelan**, v.p.-econ. planning sales (9/15/58*), $5,667; **Hayden H. Cady**, asst. v.p. & treas. (4/28/58*), $8,213; **Frank G. Colnar**, asst. v.p. & budget dir. (4/28/58*), $7,000; **E. Bailey Ranes**, asst. v.p.-pass. service (4/28/58*), $8,300; **Richard G. Schorling**, asst. v.p.-pur. & prop. (4/28/58*), $8,433; **Don R. Wilson**, asst. v.p.-operations (4/28/58*) $8,267; **S. B. Redmond**, secy., $13,533; **Paul F. Kriethe, Jr.**, asst. secy., $10,150; **C. C. West, Jr.**, exec. v.p. (11/15/58§), $25,250; **Harold B. Seifert**, v.p.-operation adm. (11/20/58§), $14,833.
NOTES: *—Date entered office. § Term expired.

DELTA AIR LINES

OFFICERS: **C. E. Woolman**, pres., gen. mgr. $53,396; **Todd G. Cole**, v.p.-adm. & finance, $28,396; **Charles H. Dolson**, v.p.-operations, $28,396; **L. C. Parker**, v.p.-traffic & sales, $28,396; **R. S. Maurer**, v.p.-legal, $19,896; **W. T. Beebe**, v.p.-personnel, $18,896; **Erle Cocke, Jr.**, v.p.-civic affairs, $18,437; **T. M. Miller**, v.p.-traffic & sales & adm., $18,437; **Robert Oppenlander**, comptroller, $13,500; **R. M. Wharton**, asst. v.p.-personnel, $12,396; **C. M. McHenry**, secy.-treas., $1,200; **Catherine Fitzgerald**, asst. treas., $6,389; **H. H. Saxon**, asst. treas., $10,599; **J. R. Howell**, asst. treas., $10,198; **C. B. Wilder**, asst. v.p.-operations technical, $15,313; **Paul W. Pate**, asst. v.p.-properties, $10,963; **Charles P. Knecht**, asst. v.p.-sales, $12,238.

NORTHEAST AIRLINES

OFFICERS: **James W. Austin**, exec. v.p. (3/25/58**), pres. (3/25/58*), $36,000; **Joel S. Daniels, Jr.**, asst. v.p.-adv. & prom. (2/1/58*), $13,200; **Nelson B. Fry**, v.p.-traffic & sales, $20,000; **George E. Gardner**, pres. & dir. (3/25/58**), chm. of board (3/25/58*), $37,500; **Paul F. Collins**, chm. of board (3/25/58**), no salary; **Hamilton Heard**, v.p.-adm. & fin., $15,000; **Robert H. Kerr**, v.p.-personnel, $13,000; **Alfred A. Lane**, v.p.-operations, $20,000; **Rembrandt P. Lane, Jr.**, treas., $17,000; **D. W. H. Mac Kinnon**, v.p.-engr. & maint., $15,000; **Wheaton W. Mies**, asst. v.p.-engr. & maint., $11,600; **James F. Molloy**, asst. v.p.-adm. & fin., $8,042; **Gerald E. Reed**, asst. treas. (7/15/58**), $8,525; **Alfred S. Walker, Jr.**, v.p.-services, $12,800; **Harry F. Zimmerman**, asst. treas. (7/16/58*), $6,417; **Henry E. Foley**, clerk of corp., no salary.
*—Date entered office. **—Date term expired.

PAN AMERICAN-GRACE AIRWAYS

OFFICERS: **Andrew B. Shea**, pres. & dir., no salary, $1,430 expenses; **Edward L. Farrell, Jr.**, v.p. & dir., no salary, $2,470 expenses; **Douglas Campbell**, v.p. & gen. mgr., $26,500, $4,000 bonus & indir., $5,215 expenses; **T. J. Kirkland**, v.p., $25,833, $3,000 bonus & indir., $4,156 expenses; **I. H. Clifton**, v.p. & compt., $22,000, $1,800 bonus & indir., $2,769 expenses; **C. S. Collins**, v.p., $18,500, $1,200 bonus & indir., $4,535 expenses; **J. T. Scholtz**, asst. v.p., $18,000, $800 bonus & indir., $1,187 expenses; **Ramon de Murias**, asst. v.p., $12,375, $450 bonus & indir., $3,671 expenses; **A. J. Phelan**, asst. compt., $14,500, $650 bonus & indir., $1,143 expenses; **W. F. Lewis**, asst. treas., $13,200, $400 bonus & indir., $1,011 expenses; **E. E. Spencer**, asst. treas., $11,583, $400 bonus & indir., $6,128 expenses.

WESTERN AIR LINES

OFFICERS: **Terrell C. Drinkwater**, pres. & dir., $67,900, $7,627 expenses; **Stanley R. Shatto**, v.p.-oper. & dir., $40,400 salary, $737 expenses; **Marvin W. Landes**, v.p.-service, $31,500 salary, $743 expenses; **Paul E. Sullivan**, v.p.-adm. & secy. (deceased 9/10/58), $21,875, $200 expenses; **Arthur F. Kelly**, v.p.-sales $31,500, $3,630 expenses; **J. Judson Taylor**, v.p. & treas., $31,500, $404 expenses; **D. P. Renda**, v.p.-legal & secy., $31,500, $3,790 expenses; **S. Gewirtz**, v.p.-adm. (10/15/58*), $6,413, $2,505 expenses; **G. G. Brooder**, v.p., $24,000, $6,921 expenses; **Charles J. Cox**, contr. & asst. treas., $24,000, $732 expenses; **William C. Jennings**, asst. secy. (10/3/58*), $2,642, $106 expenses; **John W. Simpson**, asst. secy. (10/3/58*), $2,642, $184 expenses; **E. H. Brown**, asst. secy. & dir. of personnel, $12,086, $197 expenses.

TRANS-TEXAS AIRWAYS

FASTEST–LOWEST COST

Local Service Airline

FASTEST FLYING TIMES* (MILES PER HOUR)		LOWEST OPERATING COST† (CENTS PER REVENUE MILE)	
TTA Super Starliner	**159.5**	**TTA Super Starliner**	**101.79**
DC-3 Average	146.3	DC-3 Average	119.20
Mixed Fleet Average	150.0	Mixed Fleet Average	154.85
All Carriers Average	147.8	All Carriers Average	129.84

**CAB Form 41 Reports, 4th Quarter, 1958, Local Service Airlines*
†Operating Costs Cover September, October, November, 1958

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TTA — fastest local service airline.

TTA — the only one of 13 local service airlines to pay a cash dividend.

Keeping pace with the South and Southwest

TRANS-TEXAS AIRWAYS

Route of the Super Starliners

ALLEGHENY AIRLINES

OFFICERS: **Leslie O. Barnes**, pres. & dir., $29,125, $1,282 expenses; **Walter J. Short**, v.p. & treas., $16,475, $639 expenses; **Everett K. Arnold**, v.p. & secy., $15,500, $1,119 expenses; **David L. Miller**, v.p.-traffic & sales, $16,725, $841 expenses; **Richard G. Dinning**, v.p., $15,250, $604 expenses; **W. Dale May**, asst. controller, $8,400, $186 expenses; **George F. Gerth**, asst. treas., $9,300, $222 expenses; **O. Virginia Foster**, asst. secy. (4/22/58*), $5,200; **John S. Russell, Jr.**, asst. secy., no salary.

BONANZA AIR LINES

OFFICERS: **Edmund C. Converse**, pres. & dir., $17,500, $1,510 expenses; **L. G. McNeil**, chm. of board (2/26/58**), no salary; **G. Robert Henry**, exec. v.p. & counsel, $15,333, $2,381 expenses; **Florence J. Murphy**, v.p., secy. & dir., (9/20/58**), $8,667, $776 expenses; **Myron W. Reynolds**, v.p.-operations, $15,750, $1,472 expenses; **William J. Mitchell**, v.p.-sales, $11,684, $2,850 expenses; **Robert J. Sherer**, treas., $11,684, $1,266 expenses; **Earl E. Jochim**, comp. & asst. secy., $11,017, $416 expenses; **Jack Arant**, asst. to pres., $10,917, $6,395 expenses; no shares; **Donald R. Neilson**, asst. to exec. v.p. (9/15/58*), $7,736, $520 expenses; **Vi M. Geer**, asst. secy., $5,015; **William C. Burt**, asst. secy., no salary, $74 expenses; **Frances G. Scheinbaum**, asst. secy. (9/20/58*), $4,141.
*—Date entered office. **—Date term expired.

CARIBBEAN ATLANTIC AIRLINES

OFFICERS: **Dionisio Trigo**, pres., $16,500; **Benigno Trigo**, v.p., $6,500 salary; **José M. Sierra**, v.p.-operations, $14,000, $900 bonus & indir.; **Robert B. Forrest**, v.p.-traffic, $10,000, $700 bonus & indir.; **L. A. Lockhart**, treas., $8,600, $625 bonus & indir.; **Adolfe Valdes**, sec'y., no salary.

CENTRAL AIRLINES

OFFICERS: **Keith Kahle**, pres., $16,575, $4,700 expenses; **F. E. Howe**, exec. v.p.-traffic, $15,575, $1,301 expenses; **R. L. Wageneck**, v.p.-operations, $14,417, $849 expenses; **A. S. Aldridge**, v.p.-traffic & sales, $11,496, $2,296 expenses; **C. E. Lundstrom**, secy. & asst. treas., $9,208, $385 expenses; **A. H. Pritchett**, asst. secy., $5,438; **Betty Cahagan**, asst. secy., $4,838, $25 expenses; **F. Kirk Johnson**, chm. of board, $6,417, $847 expenses; **Pearl Crawford**, asst. secy., $600; **W. A. Whitlock**, chief pilot, $13,083, $336 expenses.

MACKEY AIRLINES

OFFICERS: **Joseph C. Mackey**, pres. (6/3/58*), $8,750; **John H. Popham**, v.p. & treas. (6/3/58*), $13,000.

MOHAWK AIRLINES

OFFICERS: **R. E. Peach**, pres. & dir., $30,000; **J. R. Carver**, v.p. & dir., $23,500; **C. A. Benacoter**, v.p., $23,500; **T. J. Kirkup**, v.p., $13,000; **D. E. Pastle**, v.p., $13,500; **F. R. Cabbot**, treas. (4/25/58*), $13,500; **B. C. McLean**, secy., $9,400; **R. J. Longwell**, asst. treas., $9,000; **R. W. Jenkins**, dir. of flight operations, $16,000.
*—Date entered office.

NORTH CENTRAL AIRLINES

OFFICERS: **H. N. Carr**, pres. & dir., $35,000, $700 bonus & indir., $6,178 expenses; **F. N. Buttomer**, v.p.-traffic & sales, $13,720, $2,714 expenses; **A. E. Schwandt**, v.p.-indus. rel., $10,600, $870 expenses; **R. H. Bendio**, v.p.-maint. & engr., $12,420, $874 expenses; **A. D. Niemeyer**, v.p.-operations, $13,560, $833 expenses; **B. Sweet**, secy. & treas., $11,400, $916 expenses; **G. F. DeCoursin***, sales consult. & dir., $2,400; **A. Wheeler**, v.p., counsel & dir., $27,000, $500 fee, $38,642 exp.; **G. F. Wallis**, chief pilot, 15,$25, $1,597 expenses; **A. Hinke**, reg. chief pilot, $14,413, $5,688 expenses; **M. H. Ellyson**, reg. chief pilot, $14,413, $609 expenses; **J. D. Sims**, supt. flight control, $10,280, $4,290 expenses.

OZARK AIR LINES

OFFICERS AND DIRECTORS: **L. D. Hamilton**, chm. of board & pres., $36,000, $1,300 bonus & indir., $3,684; **F. W. Jones**, v.p.-treas., $19,688, $900 bonus & indir., $220 expenses; **A. G. Heyne**, secy., $10,000, $1,125 bonus & indir., $305 expenses; **D. L. Parks**, dir., $900 bonus & indir.; **E. W. Weaver**, dir., $900 bonus & indir., $10 expenses; **G. O. Shaver**, capt. & dir., $13,193, $1,322 bonus and indir., $161 expenses; **C. A. Bachman**, dir., $900 bonus & indir., $1,220 expenses; **E. H. Green**, dir., $300 bonus & indir.; **A. A. Blumeyer**, dir. (resigned 5/58), $375 bonus & indir.

PIEDMONT AVIATION

OFFICERS AND DIRECTORS: **T. H. Davis**, pres., treas. & dir., $20,004; **C. G. Brown, Jr.**, v.p. & dir., $11,850; **H. K. Saunders**, v.p. & dir., $15,000; **R. S. Northington**, v.p. & dir., $10,000; **M. F. Fare**, secy., asst. treas. & dir., $10,200; **T. W. Morton**, asst. cont. (4/16/58*), $7,800; **G. E. Anderson**, dir., $25 bonus & indir.; **E. L. Davis**, dir., $75 bonus & indir.; **E. L. Davis, Jr.**, dir., $75 bonus & indir.; **Frank Dowd**, dir., $25 bonus & indir.; **R. W. Gardner**, dir., $25 bonus & indir.; **Bowman Gray**, dir., $50 bonus & indir.; **C. E. Norfleet**, dir., $50 bonus & indir.
*—Date entered office.

RESORT AIRLINES

OFFICERS AND DIRECTORS: **Harold L. Graham**, pres. (8/1/58**), & dir., $9,615, $15,423 bonus & indir., $2,917 expenses; **Morris M. Townsend**, pres. (8/1/58*) & dir., $6,450, $9,000 bonus & indir., $1,250 expenses; **Thomas B. Wilson**, chm. of board & dir., $3,750, $6,021 bonus & indir., $750 expenses; **Douglas P. Larsen**, v.p., $15,000, $24,083 bonus & indir., $3,000, expenses; **Van Buren Nixon**, v.p., $12,000, $24,083 bonus & indir., $3,000 expenses; **James F. Murray**, v.p. & dir., $13,200, $24,083 bonus & indir., $3,000 expenses; **Raymond E. Hartz**, v.p., $700; **Clinton Davidson**, treas. & dir., no salary, $42,083 bonus & indir.; **John P. Simpson**, secy., $6,700; **Clifford J. Running**, asst. secy., $7,100.
*—Date entered office. **—Date resigned.

SOUTHERN AIRWAYS

OFFICERS: **Frank W. Hulse**, pres. & dir., $21,500, $2,577 expenses; **C. M. Britt**, v.p.-sales, $25,000, $3,371 expenses; **W. S. Magill**, v.p.-operations, $15,225, $557 expenses; **George F. Estey**, secy. & treas., $12,000, $1,600 expenses; **C. H. D. Tarrer**, asst. treas., $9,767, $660 expenses; **C. A. Beasley**, asst. secy. & dir., $2,400, $100 expenses; **Ike F. Jones**, v.p. & dir., no salary, $174 expenses; **W. B. White, Jr.**, asst. secy. & dir., no salary, $325 expenses.

TRANS TEXAS AIRWAYS

OFFICERS AND DIRECTORS: **R. E. McKaughan**, pres. & dir., $27,400, $4,713 expenses; **H. E. Erdmann**, v.p.-operations & dir., $14,800, $868 expenses; **L. J. Eichner**, v.p.-traffic & sales, $14,800, $1,418 expenses; **M. L. Muse**, secy. & treas., $12,800, $1,104 expenses; **W. C. Leatherwood**, v.p.-purchasing & dir., $9,400, $207 expenses; **J. M. Brooks**, mgr.-Aero Sales Div., & dir., no salary; **J. K. Ayer**, v.p.-pub. affairs & dir., $9,400, $3,370 expenses; **P. S. Reid**, v.p.-personnel, (4/24/58*), $9,400, $245 expenses.
*—Date entered office.

WEST COAST AIRLINES

OFFICERS: **Nick Bez**, pres., $18,000; **E. B. Code**, v.p., $12,600; **L. J. Hawkinson**, secy & treas., $13,550; **K. N. Laurin**, asst. treas., $8,012 salary; **Thomas R. Croson**, v.p., $10,200; **S. R. Severtson**, v.p., $12,500; **S. M. Selby**, v.p., $11,138; **Herman F. Scheurer**, v.p., $4,200; **Wm. Calvert**, v.p., no salary.

LOS ANGELES AIRWAYS

OFFICERS AND DIRECTORS: **C. M. Belinn**, pres., $22,500, $2,500 bonus & indir., $2,867 expenses; **J. T. Kane**, treas., $10,000, $1,500 bonus & indir., $839 expenses.

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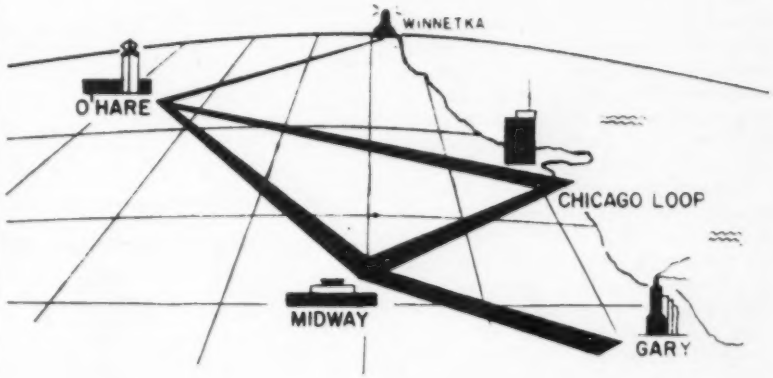

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To gain a clearer picture of the air transport industry in this country today, *AIRLIFT* has surveyed each U.S. scheduled air carrier asking the number of persons employed in each category of the broad field of maintenance, engineering, and flight crew operations.

AIRLIFT found that over 65,000 persons are working in these fields, with almost two people on the ground for each one in the air.

Of specific job assignments reported, airline pilots represent the greatest single bloc with a total of 13,084. Second largest in number are flight attendents with 9,583.

Airline maintenance and engineering forces, on the threshold of large scale turbine operations, number in excess of 40,000.

In *AIRLIFT*'s first survey into this field of airline employment, some 38 airlines reported maintenance employment at 40,210 and engineering at 923.

Because of variations in airline shop organizations, a strict allocation of employment to various line maintenance and overhaul activities could not be established. In such instances, employment is shown in the following tables as "other" and increase this category for above normal levels.

Ratio of engineering to maintenance employes consistantly runs around one in 50 in most airlines, with nine carriers reporting no engineering department at all. Aircraft overhaul employes outnumber engine overhaul nearly two to one on the average although some notable exceptions—Northwest, National, TWA, and Continental—show more engine mechanics.

In flight crew employment, a total of 39 airlines report 26,317 persons working as full time crew members.

Variations between the organization of different carriers make exact job assignment classification difficult in several instances. For example, Pan American includes its navigators in the number of pilots, and Delta lists its flight engineers as pilots.

Eastern Air Lines, with 1,727 pilots and co-pilots, 572 flight engineers and 1,397 flight attendants, is the largest employer of flight personnel of all the U.S. carriers, the total amounting to 3,696. American Airlines ranks second with a total of 3,323 and Pan American is a close third with 3,247.

In total maintenance and engineering classifications American is the easy leader with 6,434 on the payrolls. TWA follows American with 5,791 and leads Pan Am, United and Eastern.

Charts with the employment breakdown appear at the right.

FLIGHT CREW EMPLOYMENT

	Pilots and Co-pilots	Flight Engineers	Cabin Attendants	Total
Alaska Airlines	40	7	20	67
Allegheny	133	....	70	203
Aloha	29	....	14	43
American	1,489	549	1,285	3,323
Bonanza	72	....	36	108
Braniff	449	79	313	841
Capital	807	26	497	1,300
Caribair	29	....	15	44
Central	74	....	39	113
Chicago	23	....	....	23
Continental	231	20	144	395
Delta	691	....	438	1,129
Eastern	1,727	572	1,397	3,696
Ellis	12	....	....	12
Hawaiian	54	3	29	89
Lake Central	64	....	33	97
Los Angeles	14	....	....	14
Mohawk	102	....	51	153
National	334	99	274	707
New York	27	....	....	27
North Central	230	....	120	350
Northeast	321	....	155	476
Northern Consolidated	21	....	5	26
Northwest	460	168	419	1,079 [1]
Ozark	127	....	67	194
Pacific Northern	48	16	43	107
Panagra	109	....	82	191
Pan American	1,440	545	1,262	3,247
Piedmont	146	....	60	206
Resort	77	....	....	77
Riddle	186	....	....	191 [1]
Seaboard				
Southern	83	....	42	125
Trans-Texas	105	....	54	159
TWA	1,502	684	1,222	3,510 [1]
United	1,438	579	1,142	3,189 [1]
West Coast	91	....	48	139
Western	257	102	229	588
Wien Alaska	42	....	7	49
Totals	13,084	3,449	9,583	26,317

[1] Totals include navigators employed as follows: HAL (3), NWA (32), RID (5), TWA (102) and UAL (30).

AIRLINE MAINTENANCE/ENGINEERING EMPLOYMENT

	Total-Maint. & Engineering	Engineering	Total Productive	Total Overhead	Line Maint.	Aircraft Overhaul	Engine Overhaul	Instrument Overhaul	Accessory Overhaul	Communications Elr. & Tronics	Other
Alaska	170	3	..	31	25	53	22	3	9	..	11
Alaska Coastal	48	1	35	13	17	17	4	1	1	3	..
Allegheny	215	2	200	15	116	32	7	8	11	14	12
Aloha	29	..	27	5	8	4	2	1	4	4	..
American	6,434	138	4,703	1,593	2,735	1,116	458	124	609	80	437
Bonanza	83	..	52	4	17	..	..	4	..	6	..
Braniff	1,152	32	1,002	150	504	..	216	30	85	44	123
Capital	2,757	32	2,435	290	1,174	640	295	56	75	35	160
Caribair	78	1	63	15	14	41	..	..	..	6	2
Central	54	..	43	4	25	..	..	..	1	9	2
Chicago	62	..	49	13	33	7	..	..	..	1	21
Continental	459	13	381	78	144	36	53	18	17	18	..
Delta	1,814	35	1,599	180	380	150	228	60	46	69	666
Eastern	4,961	52	4,040	921	2,154	847	767	..	407	81	705
Ellis	29	1	5	3	5	6	2	1	2	4	..
Frontier	224	4	170	54	75	19	16	3	8	7	26
Hawaiian	149	1	112	35	33	6	..	..	1	9	..
Lake Central	80	..	73	6	58	73	29	4	15	14	..
Los Angeles	39	..	32	7	20	3	..	..	..	2	5
Mohawk	224	3	205	16	117	46	..	5	24	13	..
National	1,190	20	1,050	120	546	185	242	..	60	69	67
New York	57	..	48	9	35	11	..	..	..	2	..
North Central	362	4	339	43	218	52	..	..	35	34	..
Northeast	768	10	688	80	450	62	81	15	31	26	23
Northern Consolidated	42	..	39	3	4	..	..	..	..	2	30
Northwest	1 559	61	1,231	267	571	188	268	16	119	20	..
Pacific Northern	216	3	122	33	55	87	6	..	15	14	..
Pan American	5,671	122									
Piedmont	291	4	248	43	119	85	..	..	37	30	20
Resort	19	..	..	11	7	..	..	..	..	1	..
Riddle	165	8	113	44	47	..	..	..	5	21	18
Seaboard	324	12	245	67	85	60	..	22	..	11	..
Southern	142	2	115	27	62	27	..	..	18	12	23
Trans-Texas	168	1	152	16	68	39	20	..	10	14	..
TWA	5,791	121	2,586	292	2,709	642	1,176	78	86	55	549
United	5,541	231	4,598	651	2,348	814	637	..	863	..	..
West Coast	119	2	108	9	80	9	3	..	2	17	..
Western	647	4	609	34	179	..	62	9	72	22	265
Total	40,210	923	27,517	5,172	15,237	5,358	4,594	458	2,668	769	3,165

Source: Ray & Ray.

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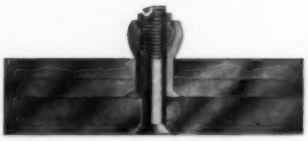
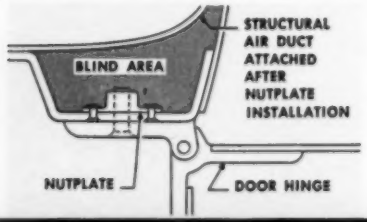
Blind Nut FIX

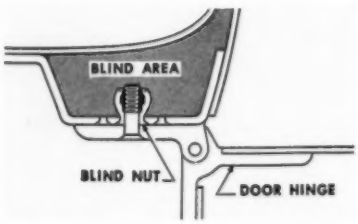
KEEPS AN F-104 ON SCHEDULE



Two damaged nutplates attaching the main landing gear door hinge to the fuselage threatened to keep a completed F-104 from entering final inspection. A conventional repair would have required the removal of a structural air duct to gain access into the closed-out area to replace the nutplates.

Blind Nuts were selected for the fix. The nutplates were drilled out, the holes were drilled slightly larger to accept the Blind Nut O.D. and the Blind Nuts were installed. The fix was successfully completed in a few minutes, a time consuming and expensive repair was eliminated and the Starfighter moved on schedule into final inspection.





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AIRLIFT Expands Statistics, Reports First Jet Results

For the initial publication of the Annual Air Transport Progress Issue under the banner of AIRLIFT, statistical services included in this edition have been expanded.

A new schedule of publication in May instead of April has permitted compilation of these statistics based on final information filed with the Civil Aeronautics Board.

Among the additions to this air transport progress section is: (1) a survey of aircraft utilization reported by airline by type of equipment for the year 1958 (See p. 89); (2) airline salaries, the earnings of executives among U.S. airlines (p. 95); (3) flight crew employment, a tabulation of all personnel employed by U.S. carriers to man the cockpits and cabins of operating transports (p. 98); and (4), engineering and maintenance employment, a survey of engineers and mechanics employed by U.S. airlines along with a breakdown of the categories of maintenance and overhaul activity in which they are engaged. (p. 98).

In addition, the statistics reported in this 10th Annual Air Transport Progress Issue for the first time reflect the experiences of carriers in the operation of two U.S.-built turbine transports, the Boeing 707 and Fairchild F-27.

The Boeing 707, seeing first service during the latter part of 1958 (October 26 to December 31) with Pan American World Airways registered these operating statistics:

Direct Operating Cost—202.0¢ per plane mile (See p. 85).
Direct Maintenance Cost—$241.62 per flight hour (See p. 86).
Average Operating Speed—472 mph (as reduced by ATC holds, lower climb speeds, etc.) (See p. 90).
Revenue Miles Flown—777,645 (Oct. 26 through Dec. 31).
Total Flying Hours—1,647
Load Factor—87.6

Also for the first time in this edition, operating performance statistics are reported on the Fairchild F-27 in local airline service:

Direct Operating Cost—Northern Consolidated 81.3¢, Piedmont 102.6¢ and West Coast 72.5¢ per plane mile.

Average Operating Speed—Northern Consolidated 220 mph; Piedmont 202 mph and West Coast 177 mph.

Revenue Miles Flown—Northern Consolidated 18,721, Piedmont 150,432 and West Coast 373,926.

Revenue Flight Hours—Northern Consolidated 85, Piedmont 744 and West Coast 2,108.

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AIR TRANSPORT

20th
Edition
1959

Official Publication
of the Air Transport
Association of America

FACTS AND FIGURES

The Standard Reference of
United States Scheduled
Air Transportation

THE PRESIDENT'S MESSAGE

Why the jets? What prompts the scheduled airline industry to invest more than three times its net worth to buy new equipment? Why should the airlines and its industry organization spend so much time and trouble trying to convince Government agencies that the civil jet age will be a good thing for the nation and that a climate of freedom is essential? Why not give up in the face of obstacles, man-made and otherwise, and merely stick with what we have?

There are many answers to those questions. During the past few years of detailed planning and preparation, airline people have referred to them all. There is the obvious value of a mighty 600-mile-an-hour airlift, paid for by private money, and available under the Civil Reserve Air Fleet plan to the nation in time of emergency. There is also the equally obvious national interest value of effective competition on a world-wide basis with the civil jets of Aeroflot, the Russian airline.

However, I think if I were pressed to provide a single answer, I would do it in the words spoken to me recently by an executive of one of our member airlines. He said:

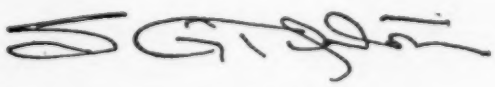
> "We're fighting to save time for people and time is just about the most precious possession people have."

It is that energetic desire to improve constantly its service to the public that has pressed the U.S.-Flag airlines forward into the jet age. This, of course, is not a new attitude on the part of the airlines. Although the jet re-equipment program is the most revolutionary, both in terms of managerial effort required and in terms of benefit for the nation, it is actually the fifth major equipment change since World War II.

The traveling public has responded to this airline desire to serve the public. It was a matter of considerable pride that in 1958, in spite of a general economic slump, that the airlines maintained the same traffic level as the year before, even while railroads and buses were slipping in passenger traffic.

The progress of the airlines in the last two decades has come about by a fruitful blend of cooperation and competition. Cooperation, that is, through the ATA and otherwise, in areas such as safety development, improvement of operational techniques, and in techniques designed to make things more convenient for the passenger or shipper. Competition, of a particular intense variety, is carried on in matters of sales promotion and market development.

The Congress, when it adopted the Civil Aeronautics Act in 1938 and enacted the Federal Aviation Act in 1958, directed the Government to promote the sound economic development of the air transport industry, legislated wisely and well. The future progress in the public interest now depends upon the ability of the industry and the Government to work together effectively in applying this Congressional mandate.



S. G. TIPTON

Definition of Terms

Passenger Miles and Ton Miles

AVAILABLE SEAT MILES FLOWN. Total seat miles available for sales in scheduled service.

AVAILABLE TON MILES. Total ton miles of lift capacity available for sales in scheduled and charter service.

CHARTER FLIGHT. Transportation of passengers or property on other than scheduled and designated extra section flights.

EXPRESS TON MILE. A ton of express flown one mile.

FREIGHT TON MILE. A ton of freight flown one mile.

PASSENGER MILE. One passenger flown one mile.

PASSENGER LOAD FACTOR. The percentage of available seat miles actually sold in scheduled service.

PASSENGER TON MILES. Passenger miles converted to ton miles. (See definition of revenue ton miles.)

REVENUE PASSENGER MILES. The number of fare paying passengers flown times the length of trip in miles. This is the amount of available seat miles sold.

REVENUE PLANE MILES. Aircraft miles flown in scheduled service.

REVENUE TON MILES. The ton miles sold in scheduled and charter service. In the construction of this traffic measure passenger miles are converted to ton miles on the basis of about 10 to 1. That is, ten passengers with allowable free baggage are accepted as equalling one ton.

SEAT MILE. One passenger seat, filled or unfilled, flown one mile.

TON MILE LOAD FACTOR. Percentage of available ton miles sold in scheduled and charter service.

U. S. MAIL TON MILE. A ton of mail flown one mile. The mail figures are in two categories. These are defined as Priority and Non-Priority. Priority mail includes air mail and air parcel post. Non-priority mail is first class mail that moves in air service. At present non-priority mail is being flown on an experimental basis between certain selected cities.

Revenues and Profit and Loss

EXPRESS REVENUE. Revenues accrued from the carriage of express.

FREIGHT REVENUE. Revenues accrued from the carriage of freight.

INCOME TAXES. Federal income taxes.

NET OPERATING INCOME. The total operating revenue from air transportation services less the operating expenses (see definition of Operating Expenses). Net Operating Income is before taxes and interest charges and does not include non-operating items.

NET PROFIT OR LOSS. Net income after Federal income taxes—the amount available for dividends or investment in the business. This figure is subject to change because of the later adjustment of some accounting transactions and through revision of mail rates and subsidy by regulatory action.

OPERATING EXPENSES. The expenses incurred in the conduct of the business except for such items as debt financing and other non-operating items.

RATE OF RETURN ON INVESTMENT. Total return, i.e. net profit plus interest paid on long term debt, as percent of average investment. Investment is the average of total net worth (stockholders equity) plus long term debt at the beginning and end of the year.

PROFIT MARGIN ON SALES. Net profit after interest and after taxes as per cent of operating revenues.

OTHER REVENUE. All other revenues, including excess baggage, chartered services, foreign mails, penalties for failure to cancel reservation, service charges on non-revenue transportation of employees and special services such as photography and crop dusting.

PASSENGER REVENUES. Passenger revenues from scheduled operations.

PUBLIC SERVICE REVENUES. Payments by the Federal Government to insure air service to communities in the United States and its territories which could not otherwise afford it; to maintain essential international air routes which are not yet self-supporting; and to develop helicopter service.

U. S. MAIL REVENUE. Service revenue for the transportation of mail. This is the amount paid by the Post Office to purchase air transportation for mail, and is not subsidy.

Air Transport

FACTS AND FIGURES

20th Edition, 1959

The year 1959 is the first year of air transport operation under the new Federal Aviation Act, passed last year. To demonstrate how the industry has increased its public usefulness over the years, this edition of Facts and Figures compares two decades of growth by showing figures for 1939, 1949, and 1958. In addition, the three years prior to 1958 are listed to show a more recent pattern of growth. Revised data filed by the scheduled air carriers with the Civil Aeronautics Board and the records of the Interstate Commerce Commission served as the major sources of the statistics.

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THE YEAR IN REVIEW

1958 was the twenty-first year of airline operations under the Civil Aeronautics Act. The year saw, not only the inauguration of commercial jet transportation, but other developments that will also have significance in the years to come.

● **The Federal Aviation Act.** During the year, the Congress enacted the Federal Aviation Act of 1958. The Act repeals the Air Commerce Act of 1926 and the Civil Aeronautics Act of 1938. It created the Federal Aviation Agency with this objective: "To provide for the safe and efficient use of the airspace by both civil and military operations, and to provide for the regulation and promotion of civil aviation in such manner as to best foster its development and safety."

Incorporated into the new agency are the Civil Aeronautics Administration, the Airways Modernization Board, and the safety-rulemaking authority of the Civil Aeronautics Board.

The Administrator, E. R. Quesada, appointed by the President, has the authority to "regulate establish, operate and improve air navigation facilities; to prescribe air traffic rules for all aircraft; and to conduct related research and development activities."

● **The Cherington–Quesada Report.** This important report, "The Status and Economic Significance of the Airline Equipment Investment Program," was sent to Congress by President Eisenhower in August. Written by Paul W. Cherington, Professor of Business Administration, School of Business, Harvard University, it was presented to the President by E. R. Quesada, the President's Special Assistant for aviation matters.

Writing to Congress, President Eisenhower said: "This report sets forth, in some detail, the present status of the major air carriers and discusses their ability to implement their investment program of approximately $4 billion in aircraft and equipment. This program is of such a size as to hold some significance to the national economy over the next few years."

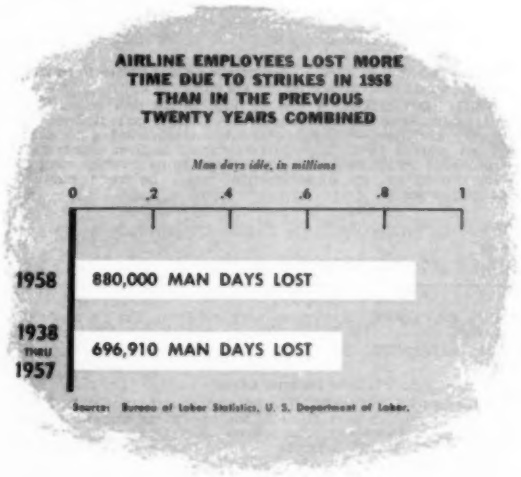
● **The Transportation Tax.** In 1958, the three per cent tax on shipment of freight for hire carriers was repealed.

Still remaining is the 10 per cent Federal transportation tax on passengers.

● **Balance at the Bargaining Table.** In November, six airlines joined in an agreement that allows limited financial assistance to those members of the agreement shut down by strikes. The payments are based on the additional net revenues received by the carriers still in operation.

The agreement was presented to the Civil Aeronautics Board and in a press release decision the CAB said the plan was "not adverse to the public interest and should be approved."

This plan was advanced by the airlines to deter strikes which in 1958 alone forced cancellation or disruption of the travel plans of over 2,500,000 passengers.



Historically, airlines have not had the economic resources to withstand long and costly strikes. This situation has led to an imbalance at the bargaining table where labor uses the strike, and the strike threat, most effectively. Most airline unions are national in scope and for years have employed various forms of mutual aid to assist one another.

● **The Airlines Hold the Line.** Despite the continually upward spiraling of costs over the last 20 years the scheduled air carriers of the U. S. are now offering the public a fare level only 3.2 per cent greater than the 1939 level.

During this time, the airlines have greatly expanded their usefulness by adding more cities to their network, carrying more passengers, more freight and by increasing their service to the Post Office Department.

Their contribution to the national defense has also increased. Today, more than 300 long-range, four-engine aircraft are available to the Department of Defense on 36 hours' notice for airlift in the event of a national emergency.

On Stage in 1958—The Civil Jet Age

Last year, the first U. S. commercial pure jet planes went into scheduled operation.

Observers were quick to note the many benefits that will flow from this new era in public transportation. The speed of the new planes, the comfort they will afford passengers, the almost-revolutionary changes that will improve the lot of the traveler, shipper and postal user, were all cited as some of the major benefits.

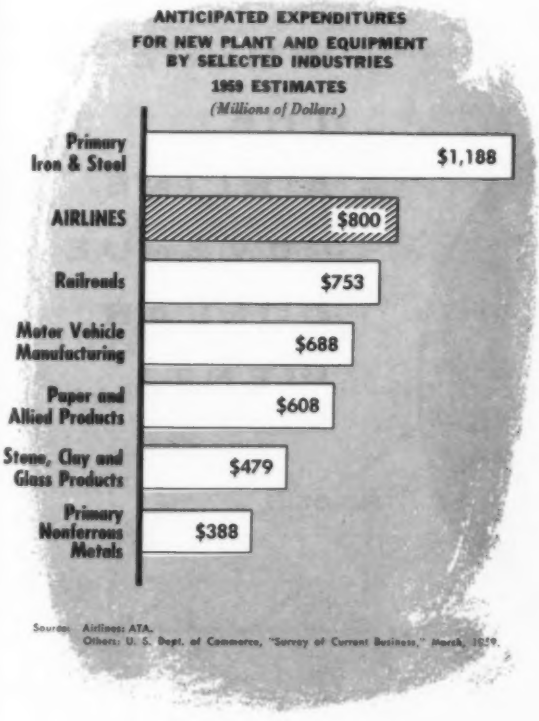
This Age means business, not only in terms of the multi-billion-dollar investment that will go into the planes and the supporting equipment right now, but more importantly, in the years to come.

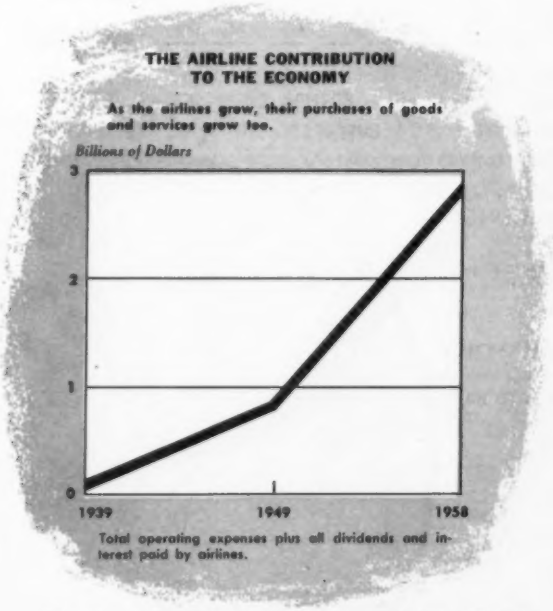
Here is how the investment will be apportioned:

- $2,500,000,000 for new aircraft, along with spare parts and engines.
- $ 250,000,000 for supporting ground equipment, hangars, maintenance bases and other equipment
- $ 220,000,000 to be spent by others for facilities but to be taken over, and paid for, by the airlines.

The investment for 1959 alone compares favorably with the capital expenditures of basic manufacturing industries.

The overall importance of the investment to the general economy promises to have a far greater, and more lasting, benefit in the long run than the temporary pump-priming effect of the aircraft orders.





The investment is radiating out into the nation's economy, creating more jobs, and making existing jobs more secure, by the need to; (1), supply the airline orders, and; (2), maintain this enormous fleet when it is delivered and in scheduled service.

WHERE THE AIRLINE REVENUE DOLLAR CAME FROM IN 1958*

AND

WHERE THE AIRLINE REVENUE DOLLAR WENT

*For the 12-month period ending September 30, 1958.

Mr. Cherington estimated that the jet program of the airlines directly involves an average of 80,000 to 125,000 net additional jobs annually in the economy and indirectly still more.

He also saw the equipment program of the airlines as a matter of "direct concern" to the income of 5,000 business firms.

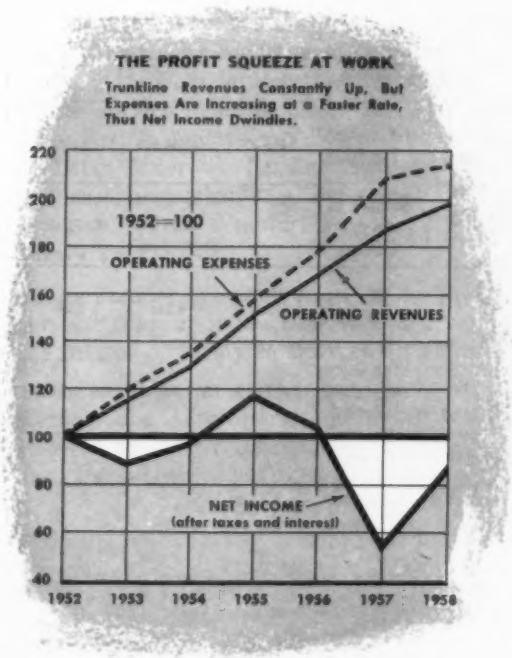
The airlines are good customers of more than 10,000 different concerns who supply the more than 100,000 different items that carriers need.

Last year their spending reached an all-time peak when they pumped back into the economy more than two billion dollars to suppliers, employees and, through taxes, to Federal, state and local agencies.

The largest part of this re-investment in the economy was for wages and salaries, a total payroll of about $950,000,000. The rest of the airline expenditures were spread out over an almost infinite list of supplies; from thumb tacks to the enormous, and expensive, rubber tires for the aircraft themselves.

A Look at Airline Earnings

Financially, 1958 was the same kind of frustrating year that the air transport industry had experienced in 1957; record-breaking revenues, all-time highs in traffic but, when all the bills were paid, a net profit that remained at a critically low level.



Specifically, the airlines of the United States last year took in $2,237,469,000 in operating revenues, spent $2,131,542,000 for operating expenses and kept only $52,914,000 as a net profit, after taxes and interest.

The revenue and the expense figures were the highest ever; the net profit compares with $56,046,000 in 1951 when the airlines grossed $1,019,672,000, less than ½ of the 1958 level.

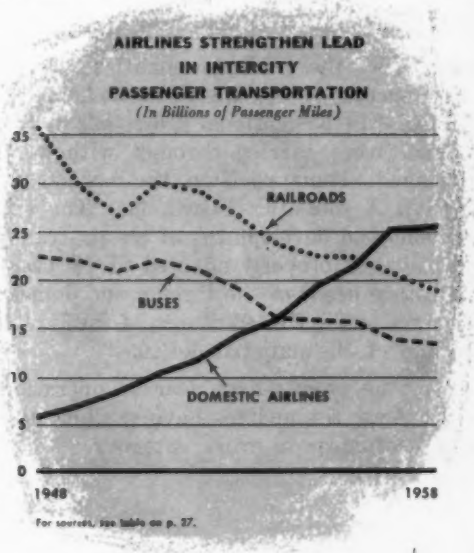
The Civil Aeronautics Board granted two temporary fare adjustments during the last year. Approximately 70 million dollars were added to domestic airline revenues because of these fare adjustments:

- On February 10, the CAB authorized the domestic airlines to raise their basic fares by 4 per cent, in both first class and coach and add $1 per ticket.
- In October, the CAB permitted the domestic airlines to eliminate the roundtrip discount of 5 per cent, remove the free stopover privileges, and reduce the discount for family dependent travel from 50 per cent to 33⅓ per cent.

Airline Traffic Continued to Gain

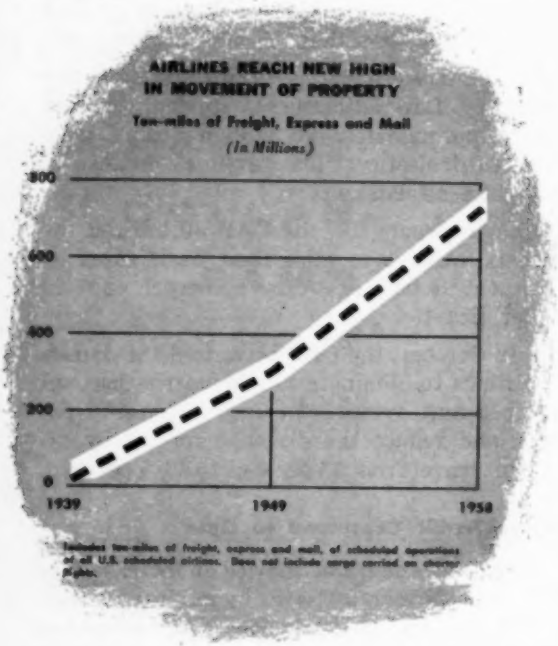
Overall, airline traffic showed an increase over 1957. This increase was significant when viewed against the backdrop of a nationwide recession during part of the year and a series of airline strikes during the latter part of the year.

The domestic airlines; compared with their public transportation competitors, the railroads and the buses; more than held their own. While



the airlines maintained their 1957 level, the railroads' passenger traffic dropped 14 per cent and the buses dropped two per cent.

For 1958 compared to 1957, the scheduled airlines operated a record high of revenue ton miles, 4,075,000,000, but it was only a 1.8 per cent increase over the previous year.



Mail reached new highs with a 177,000,000 ton-mile haul. Express was up six per cent to a new peak of 48,837,000 miles but freight traffic, due to the cessation of common carriage by one of the major all-cargo carriers, showed a drop.

Progress Under the Aviation Acts

During 1958, the Civil Aeronautics Act of 1938 was succeeded by the Federal Aviation Act of 1958. The promotional provisions of the original act were carried through without a word changed. That provision, the basic tenet of the Civil Aeronautics Board, is: "The encouragement and development of an air transportation system properly adapted to the present and future needs of the foreign and domestic commerce of the United States, of the Postal Service and of the national defense."

In 1958, the twenty-first year of operation under the Acts, the airlines have reached new peaks of usefulness in every category.

This growth has been possible because the airlines in their efforts to serve the public have provided service in continuously greater abundance, while improving their dependability over the years.

The air transport industry has been aided by public service revenues, or subsidy, just as the waterways and railroads were helped when they were young industries.

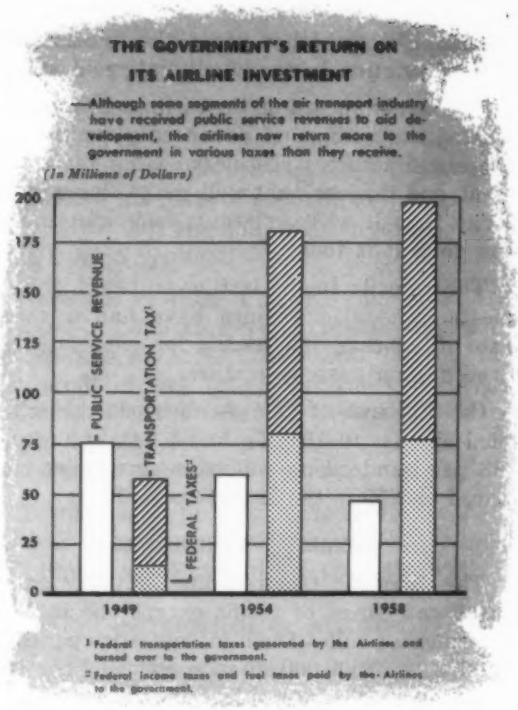
THE AIRLINE STORY

Ever Increasing Usefulness Over The Years

All classes of Certificated Air Carriers	1939	1949	1958
Number of Airlines	23	45	55
Cities Served (excluding Alaskan points) [2]	286	638	703
Aircraft in Service	347	1,083	1,900
Seats Available (Daily)	5,100	35,900	103,700
Cruising Speed of Fastest Transport	220 mph	315 mph	590 mph
Number of People Employed	13,300	76,000	146,000
Total Airline Payrolls	$24,000,000	$349,000,000	$950,000,000
U. S. Mail Ton Miles	8,610,000	61,144,000	177,430,000
Number of Passengers Carried	1,864,000	16,723,000	49,075,000
Average Fare	5.62¢	6.23¢	5.8¢
Ton Miles of Freight Carried	2,713,000 [1]	112,500,000	501,591,000

[1] Freight and Express combined.

[2] Early figures for Alaska not available but in 1938 there were 268 points served.


THE GOVERNMENT'S RETURN ON ITS AIRLINE INVESTMENT
—Although some segments of the air transport industry have received public service revenues to aid development, the airlines now return more to the government in various taxes than they receive.
(In Millions of Dollars)
200
175
150
125
100
75
50
25
0
PUBLIC SERVICE REVENUE
TRANSPORTATION TAX[1]
FEDERAL TAXES[2]
1949
1954
1958
[1] Federal transportation taxes generated by the Airlines and turned over to the government.
[2] Federal income taxes and fuel taxes paid by the Airlines to the government.

While the total amount of aid that has been given to the domestic airlines since 1938 is small in relation to many other support programs of the United States government, the country has benefitted from the investment in an actual return that now approaches the billion-dollar-mark.

Subsidy now accounts for only 2.2 per cent of the total airline revenues. The greater part of the government aid today goes to the local service airlines in order to guarantee air service to smaller communities. Other subsidy payments go to help develop the experimental helicopter service in three cities, for Alaskan airlines, and to maintain national interest routes in Latin America. No domestic trunk line is now receiving subsidy.

Safety in the Air

The number one concern in the airline industry last year, as it has been in every year, was the matter of safety in the air.

The airlines in cooperation with the Civil Aeronautics Administration, now part of the Federal Aviation Agency, and the military services, have been working toward reducing the hazard of mid-air collisions by seeking a means of positive separation of aircraft flying the nation's airways.

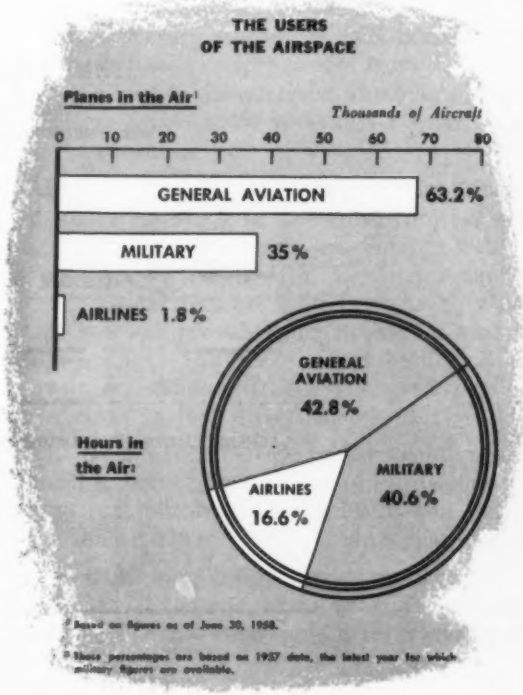
The airlines had voluntarily placed all of their planes flying above 18,000 feet on instrument flight rules, which meant that above that altitude, all airliners were separated from each other. This level was lowered in mid-1958 to the 10,000 foot level. During the year, the military also adopted some restrictions of "see-and-be-seen" operations.

Another step to make air transportation still safer was the setting up, by the Civil Aeronautics Board, of three Super Skyways that connect New York and Washington with Los Angeles and San Francisco. These special airways extend from 17,000 to 22,000 feet and no airplane is permitted to use, or even cross, these airways without specific permission of the traffic control centers.

Plans are now underway to extend this system of positive control highways to other parts of the air traffic control system.

Air Traffic Control and the New Jets

The new jets flying greater speeds and at higher altitudes, will be handled in the existing



system, but with special consideration. Working with the close cooperation of the military, the high-flying jets will be tracked, and radar separation will be provided, for aircraft operating above 24,000 feet. This is being done by FAA traffic controllers and utilizes the existing long-range radar of the Air Defense Command.

The airspace—that rapidly dwindling natural, and public, resource—has now for the first time been placed under single, and unified, management. The management is the Federal Aviation Agency.

The Air Force estimates that the military planes fly about ten million hours a year—within the continental U.S. The general aviation planes fly about 11½ million hours a year and the airlines about 4½ million hours.

Complicating the problem of allocation is the fact that not all of the navigable airspace can be used. Areas around radio-TV towers and tall buildings and over natural preserves are closed off to all kinds of flying. Also, some 130,000 square miles over the continental U.S. are closed off to non-military flying.

The end result of the planning on the part of the airlines and the government, with the cooperation of the other users, the military and general aviation, has as its ultimate goal, safety.

The safety record of the airlines has demonstrated the wisdom of advanced planning, and the manufacturers ceaseless search for equipment and devices that will make flying safer today than it was yesterday, and safer tomorrow than it is today.

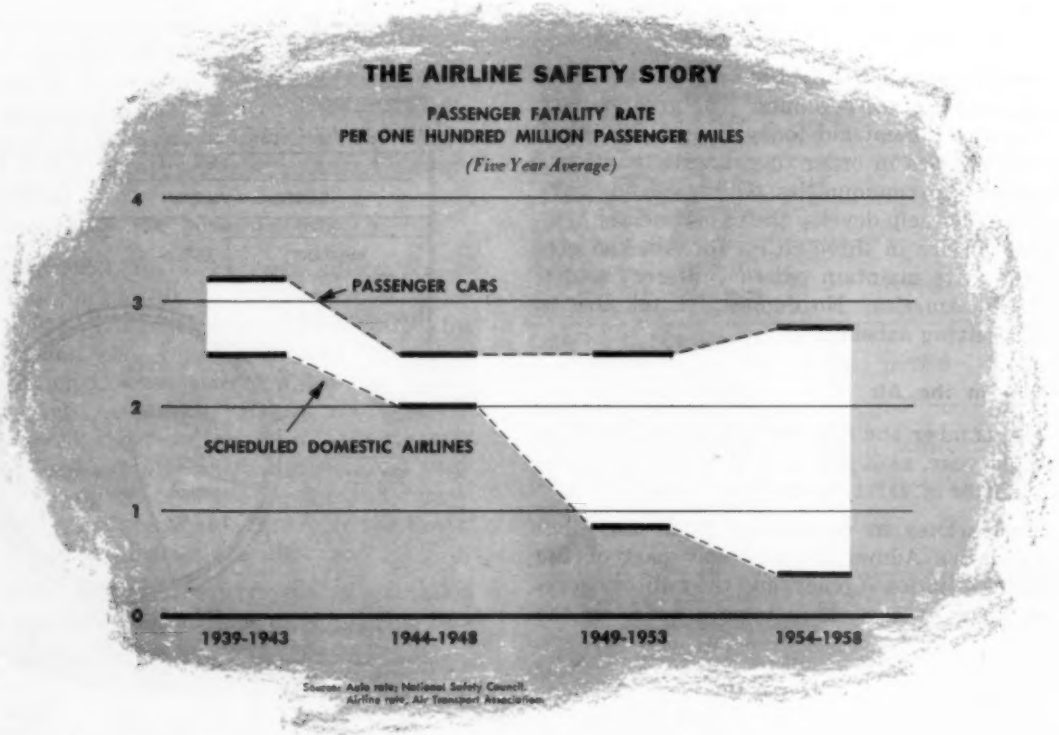
The record: In the last seven years, the domestic scheduled airlines have had a safety rate of less than one fatality for every one hundred million passenger miles.

On the basis of five year periods the scheduled airlines in 1954-58 had a fatality rate of .38 per hundred million passenger miles compared to 2.55 in the 1939-43 period.

DOMESTIC TRUNKLINES

The domestic trunk airline industry gained in all categories of traffic except one in 1958. Revenue ton miles flown in domestic operations totaled 2,750,900,000, an increase of 1.1 per cent.

The 12 trunklines flew a total of 24,435,-700,000 passenger miles in scheduled service over their domestic routes in 1958, a decline of 0.3 per cent from 1957.



Domestic trunkline freight traffic increase 10.1 per cent to 240,510,000 ton miles in 1958.

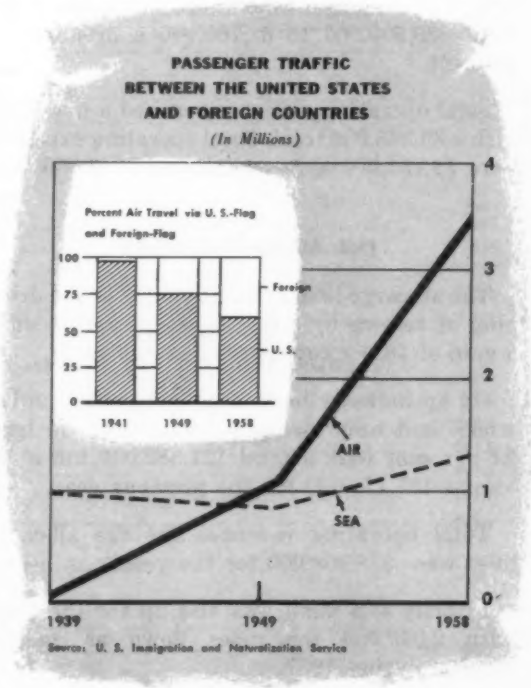
The trunklines gained also in mail and express volume. They flew 45,890,000 ton miles of air express, an increase of 7.3 per cent; 87,809,000 ton miles of air mail, up 7.0 per cent; and 16,155,000 ton miles of non-priority mail, a gain of 6.7 per cent.

Revenues reached a record high of $1,513,019,000 in 1958. However, expenses also rose to an all-time high; $1,418,486,000, leading to a net profit of $44,709,000 for the year. While $17,721,000 higher than in 1957, the 1958 net profit was $13,003,000 less than that in 1956 and about equal to 1951 earnings.

Trunkline jet programming indicates that a total of 62 pure-jet and 185 prop-jet airliners will have been delivered the end of 1959.

INTERNATIONAL AIRLINES

The fastest service in international airline history was introduced in 1958 but U.S.-flag airlines saw their share of the total market continue to shrink. Two-thirds of the increased air travel between the U. S. and foreign countries was secured by foreign flag airlines.



It was a record year for traffic. U.S.-flag airlines flew an all-time high of 5,974,600,000 revenue passenger miles, up 3.9% from the previous record total of 5,751,700,000 in 1957. Cargo ton-miles reached a new high of 128,925,000 for an increase of 4.6% over 1957.

The gap between air and sea travelers widened with air traffic accounting for three-fourths of the total U.S.-foreign market. But increased competition from foreign flag airlines was evident as those carriers, for the first time, carried more passengers to and from the U.S. than all steamship companies combined, increased their share of the total U.S.-foreign air market to 40% and, in such vital areas as the North Atlantic, widened their share to 59% by year end.

LOCAL SERVICE AIRLINES

Major objectives of the local service airline industry are fleet modernization to increase efficiency, improve service and stimulate traffic and to reduce subsidy. Two carriers introduced turbine-powered aircraft in 1958. Several others are introducing turbine aircraft and more efficient piston-engine airliners during 1959.

Guaranteed loan and related federal legislation aimed at facilitating the re-equipment program aided developments during the year. A capital gains bill, enacted in 1958, permits local service airlines to apply profits from the sale of older aircraft to the purchase of modern planes. Formerly proceeds were deducted from public service revenues.

While beneficial in securing equipment financing, these measures do not substitute for adequate earnings. In the "Local Service Rate of Return Case" before the Civil Aeronautics Board, the carriers are seeking regulatory policies that will provide opportunity for reasonable earnings. The Board has stated it will improve the regulatory framework and has taken some steps in that direction.

The local airline service pattern continues to expand rapidly. The 13 carriers were operating 35,586 unduplicated route miles at the end of 1958, some 2,000 miles more than a year earlier.

The number of cities served increased from 468 to 516 at the end of the year. It is significant that 283 of those communities would other-

wise be without scheduled airline passenger, mail and freight service.

The local service airlines gained in all categories of traffic in 1958. They carried 4,265,000 persons in scheduled service—10 times more than 11 years previously. They flew 820,200,000 passenger-miles, an increase of 9.8 per cent over 1957.

Because of traffic development and efficiency gains, the proportion of federal support has declined sharply. Public service revenues have dropped from about 65 per cent of total revenues in 1948 to 34 per cent in 1958.

HELICOPTER CARRIERS

During 1958, the scheduled helicopter carriers continued their upward traffic trend registered so markedly the previous year.

Revenue ton miles, the overall indicator of activity, were up 33.5 per cent for the year, from 448,000 to 598,000 a new high.

The helicopter lines carried 228,000 passengers during the year, a 54.1 per cent increase over the previous year. The passenger-mile figure was up, too, during 1958. The lines operated 4,885,000 passenger miles, a 43.9 per cent gain over the year before.

Available ton miles were at a new peak. The helicopter lines operated 1,497,000 available ton miles in 1958, compared with 1,056,000 in 1957, a gain of 41.8 per cent.

Together, the three helicopter lines operate 22 aircraft over 905 route miles serving 29 points.

THE ALASKAN CARRIERS

Alaska's entrance into the Union in the late summer of 1958 bodes well for future travel to our 49th State. A spokesman for the scheduled airline industry puts it this way:

"With admission of Alaska to statehood, our national frontiers have been materially broadened. As a result, added traffic volume is anticipated both from increased tourism and from the greater influx of industry and population. Routes covered by the Alaskan carriers serve the most densely populated and industrialized areas of Alaska and the airlines (Alaskan) should continue to participate in the future growth of the new State."

Revenue ton miles were up over 1957, 32,901,000 versus 32,513,000—a 1.2 per cent gain.

The Alaskan carriers flew more passengers during the year than they did the year before. 315,000 passengers were flown compared with 309,000 during 1957. Passenger miles were up, also, with 1958 showing an all-time peak of 163,800,000, 7.8 per cent over 1957.

TERRITORIAL CARRIERS

The territorial carriers flew more revenue ton miles in 1958 than in any previous year.

They reached 11,264,000 a gain of 24.3 per cent over 1957 when 9,065,000 revenue ton miles were flown.

Freight ton miles were up, to 1,587,000 from 1,536,000 a gain of 3.3 per cent.

In scheduled passenger operations, the territorial carriers dropped below the 1957 results. They carried 572,000 passengers in 1958 compared with 589,000 the year before. Similarly, the passenger mile figure was down, from 1957's 89,500,000 to 82,700,000 a drop of 7.6 per cent.

Total operating revenues reached a new high with a $9,396,000 total. Total operating expenses were $9,254,000 and net income, $142,000.

THE ALL-CARGO LINES

The all-cargo lines after allowing for the dropping of service by a major cargo-carrier show a gain of 18 per cent over the prior year.

On an industry basis their freight ton miles, which had been rising steadily, dropped back 21 per cent with a total 121,382,000 ton miles versus 155,126,000 for the previous year.

Total operating revenues for the all-cargo lines were $78,908,000 for the year.

Priority U.S. mail was also up for the year, with 2,040,000 ton miles flown as against 440,000 during 1957.

AVAILABLE SERVICE AND UTILIZATION

U. S. Scheduled Airline Industry

(For Selected Years, In Millions)

THIS TABLE SHOWS THE EVER INCREASING GROWTH IN THE SERVICES THE SCHEDULED AIRLINES ARE OFFERING TO THE PUBLIC AND THE INCREASING USE OF THIS SERVICE BY THE PEOPLE, THE GOVERNMENT AND SHIPPERS.
LOAD FACTOR IS THE PERCENTAGE OF CAPACITY WHICH IS SOLD.

	Available Ton Miles Flown	Revenue Ton Miles Flown	Ton Mile Load Factor (%)	Available Seat Miles Flown	Revenue Passenger Miles Flown	Passenger Load Factor (%)	Revenue Plane Miles Flown
Domestic Trunk Airlines							
1939	N.A.	76.5	.....	1,209.6	654.0	54.07	82.8
1949	1,517.4	801.2	52.80	11,117.7	6,570.7	59.10	323.2
1955	3,882.7	2,160.1	55.63	30,001.3	19,217.2	64.05	564.0
1956	4,393.2	2,417.0	55.02	33,752.6	21,643.1	64.12	622.1
1957	5,150.4	2,720.0	52.81	39,838.2	24,499.5	61.50	711.1
1958	5,190.2	2,750.9	53.00	40,695.0	24,435.7	60.05	700.6
Local Service Airlines							
1939[1]	.....	.....	.....	.....	.....	.....	.....
1949	46.4	14.2	30.69	477.9	134.7	28.18	24.5
1955	121.9	55.3	45.36	1,161.4	523.3	45.06	50.9
1956	145.6	66.8	45.91	1,385.0	633.2	45.72	59.5
1957	170.7	78.5	46.00	1,653.8	747.3	45.19	67.3
1958	185.4	86.6	46.71	1,793.5	820.2	45.73	72.3
Territorial Airlines							
1939	N.A.	.3	.....	5.5	3.1	56.74	.4
1949	10.1	5.2	51.45	91.3	52.6	57.19	4.0
1955	16.1	8.4	52.10	134.7	78.1	57.99	4.6
1956	16.0	8.5	53.03	147.9	83.9	56.70	4.6
1957	15.7	9.1	57.96	154.9	89.5	57.78	4.7
1958	18.4	11.3	61.41	143.1	82.7	57.79	4.4
Helicopter Airlines *(in thousands)*							
1939[1]	.....	.....	.....	.....	.....	.....	.....
1949	142	46	32.39	.....	.....	.....	412
1955	434	195	44.93	1,708	628	36.77	1,148
1956	567	277	49.03	3,561	1,588	44.59	1,315
1957	1,056	448	42.42	8,049	3,272	40.66	1,604
1958	1,497	598	36.95	11,419	4,885	42.78	1,675
International and Overseas Airlines							
1939	N.A.	77.2[2]	.....	134.4	71.8	53.46	7.6
1949	540.3	309.5	57.28	3,624.7	2,054.0	56.67	104.5
1955	984.6	633.8	64.37	7,012.1	4,410.8	62.90	130.7
1956	1,143.4	741.2	64.82	8,073.1	5,113.2	63.34	146.0
1957	1,292.9	827.0	63.96	9,038.1	5,751.7	63.64	155.7
1958	1,426.6	873.1	61.20	10,057.6	5,974.6	59.40	165.5
Alaskan Airlines							
1939[1]	.....	.....	.....	.....	.....	.....	.....
1949	20.3	11.2	55.32	38.9	15.4	39.64	3.9
1955	46.0	29.4	63.87	233.9	110.4	47.20	10.5
1956	66.9	44.8	66.98	284.1	137.0	48.21	11.3
1957	59.4	32.5	55.08	329.7	151.9	46.07	11.5
1958	59.9	32.9	54.94	369.0	163.8	44.39	11.5

See Footnotes at End of Table on Page 14

Available Service and Utilization *(continued)*	Available Ton Miles Flown	Revenue Ton Miles Flown	Ton Mile Load Factor (%)	Available Seat Miles Flown	Revenue Passenger Miles Flown	Passenger Load Factor (%)	Revenue Plane Miles Flown
All-Cargo Airlines							
1939[1]	-----	-----	-----	-----	-----	-----	-----
1949[1]	16.5	11.7	70.20	-----	-----	-----	2.8
1955	184.0	135.1	73.41	-----	-----	-----	17.1
1956	321.5	248.8	77.38	-----	-----	-----	23.5
1957	431.7	336.9	78.04	-----	-----	-----	23.3
1958	383.8	319.3	83.20	-----	-----	-----	16.1
CONSOLIDATED INDUSTRY							
1939[1]	-----	154.0[2]	-----	1,349.5	728.9	54.01	90.8
1949[1]	2,151.0	1,153.1	53.61	15,350.5	8,827.4	57.50	462.9
1955	5,235.7	3,022.2	57.72	38,545.1	24,340.4	63.15	779.0
1956	6,087.1	3,527.4	57.95	43,646.3	27,612.0	63.26	868.4
1957	7,121.5	4,004.4	56.23	51,022.7	31,243.1	61.23	975.3
1958	7,265.7	4,074.7	56.08	53,069.6	31,481.9	59.32	972.1

[1] Data not available for Alaskan airlines in 1939.
Local Service operations initiated in 1945.
Helicopter operations started in 1947, passenger service began in 1953.
All-Cargo Airlines began operations in fourth quarter of 1949.

[2] Revenue Ton Mile data for items other than passenger ton miles for International and Overseas carriers not available for 1939, hence total does not reflect these items.

N.A. Not Available.

Note: Available Ton Miles and Revenue Ton Miles include charter operations; all other items are for scheduled service only.

PERSONNEL EMPLOYED BY THE SCHEDULED AIRLINE INDUSTRY

(1940-1958)

Year	Pilots and copilots	Other Flight Personnel	Pursers, Stewards, Stewardesses	Communications personnel	Mechanics	Aircraft and traffic servicing personnel	Office employees	All others	Total
1940	2,279	33	1,036	193	5,413	4,277	7,689	1,131	22,051
1941	2,664	49	1,210	220	6,389	4,931	9,710	1,285	26,458
1942	3,146	241	1,131	1,610	12,882	7,384	11,083	2,236	39,713
1943	2,332	330	992	2,196	10,411	5,191	12,832	4,995	39,279
1944	3,345	277	1,516	2,501	9,963	5,748	15,234	4,023	42,607
1945	5,897	1,046	2,486	3,477	15,943	9,447	23,904	6,081	68,281
1946	7,220	1,503	4,421	5,031	23,376	12,770	31,587	10,646	96,554
1947	6,637	1,333	4,077	3,829	21,140	11,610	32,691	3,835	85,152
1948	6,926	1,515	4,142	3,661	21,828	11,662	31,145	3,729	84,608
1949	6,843	1,602	4,341	3,581	19,535	11,674	30,148	3,270	80,994
1950	7,277	1,521	4,427	3,403	19,606	12,256	31,138	3,158	82,786
1951	8,386	1,708	5,303	3,618	23,477	14,370	35,081	3,810	95,753
1952	8,770	1,852	5,859	3,653	26,162	15,588	37,894	4,294	104,072
1953	9,437	2,146	6,106	3,567	26,105	17,353	40,319	4,359	109,392
1954	9,495	2,525	6,363	3,332	25,173	17,855	40,670	4,128	109,541
1955	10,857	2,762	7,454	3,499	29,196	19,114	45,030	4,291	122,203
1956	11,386	3,384	8,097	3,605	30,962	20,657	49,336	4,076	131,503
1957	13,286	3,797	9,450	4,004	31,162	36,052	31,799	17,640	147,190
1958	12,944	3,829	9,847	3,908	29,221	35,415	29,602	18,103	142,869[p]

[p] These are preliminary figures based on reports from a majority of the airlines as of September 30th.

REVENUE TON MILES OF TRAFFIC CARRIED

U. S. Scheduled Airline Industry

(For Selected Years, In Thousands of Revenue Ton Miles)

THIS TABLE SHOWS, BY CATEGORIES, THE EVER INCREASING USE OF THE SCHEDULED AIRLINES BY PASSENGERS AND COMMERCE

	Passenger[1]	Priority U. S. Mail	Non Priority[2] U. S. Mail	Express	Freight[3]	Charter Flights	Excess Baggage[4]	Total
Domestic Trunklines								
1939	64,577	8,608	.....	.....	2,705	.....	597	76,487
1949	624,219	40,874	.....	27,329	94,190	7,483	7,102	801,197
1955	1,825,631	71,859	14,175	49,603	174,017	5,737	19,046	2,160,068
1956	2,056,098	77,788	13,891	49,709	190,592	5,911	23,055	2,417,044
1957	2,327,334	82,057	15,137	42,752	218,432	6,335	27,983	2,720,030
1958	2,321,347	87,809	16,155	45,890	240,510	12,000	27,237	2,750,948
Local Service Airlines								
1939[5]	.....	.....	.....	.....	.....	.....	.....	.....
1949[5]	12,796	428	.....	320	436	194	60	14,234
1955	49,713	928	328	1,403	1,355	1,338	245	55,310
1956	60,156	1,192	344	1,687	1,624	1,520	320	66,843
1957	71,079	1,174	345	1,642	2,082	1,717	471	78,510
1958	78,055	1,330	395	1,801	2,241	2,196	575	86,593
Territorial Airlines								
1939	299	2	.....	.....	8	n.a.	2	311
1949	4,206	70	.....	124	618	123	66	5,207
1955	6,250	59	.....	n.a.	1,646	436	20	8,411
1956	6,710	63	2	.....	1,475	236	17	8,503
1957	7,259	63	1	.....	1,536	170	36	9,065
1958	6,611	67	2	.....	1,587	2,965	32	11,264
Helicopter Airlines								
1939[5]	.....	.....	.....	.....	.....	.....	.....	.....
1949	.....	46	.....	.....	.....	.....	.....	46
1955	60	96	.....	31	5	.....	3	195
1956	149	89	.....	31	7	.....	1	277
1957	311	92	.....	33	8	3	1	448
1958	465	84	.....	34	6	6	3	598
International and Overseas Airlines								
1939	77,233	n.a.	.....	n.a.	n.a.	n.a.	n.a.	77,233[6]
1949	220,805	19,772	.....	49,444	6,714	3,233	9,515	309,483
1955	453,195	52,409	.....	243	90,598	19,701	17,648	633,794
1956	524,369	55,158	.....	.....	109,235	32,652	19,757	741,171
1957	589,510	57,265	.....	.....	123,280	36,188	20,771	827,014
1958	597,326	65,825	.....	.....	128,925	60,832	20,195	873,103
Alaskan Airlines								
1939[5]	.....	.....	.....	.....	.....	.....	.....	.....
1949	1,659	479	.....	.....	618	8,449	27	11,232
1955	11,868	2,279	.....	.....	7,300	7,773	152	29,372
1956	14,719	2,383	.....	.....	7,948	19,527	241	44,818
1957	16,002	2,695	.....	.....	7,201	6,344	271	32,513
1958	17,289	3,102	.....	.....	6,940	5,270	300	32,901

See Footnotes at End of Table on Page 16

Revenue Ton Miles of Traffic Carried *(continued)*	Passenger[6]	Priority U. S. Mail	Non Priority[5] U. S. Mail	Express	Freight[2]	Charter Flights	Excess Baggage	Total
All-Cargo Airlines								
1939[1]	.....	.....	.....	.....	.....	.....	.....	.....
1949[1]	.....	.....	.....	.....	10,542	1,124	.....	11,666
1955	.....	.....	318	.....	107,945	26,796	.....	135,059
1956	.....	381	1,188	1,266	140,420	105,526	.....	248,781
1957	.....	440	1,409	1,638	155,126	178,249	.....	336,862
1958	.....	2,040	621	1,112	121,382	194,104	61[7]	319,320
CONSOLIDATED INDUSTRY								
1939[1]	142,109	8,610	.....	.....	2,713	.....	599	154,031[3]
1949[1]	863,685	61,669	.....	77,217	113,118	20,606	16,770	1,153,065
1955	2,346,717	127,630	14,821	51,280	382,866	61,781	37,114	3,022,209
1956	2,662,201	137,054	15,425	52,693	451,301	165,372	43,391	3,527,437
1957	3,011,495	143,786	16,892	46,065	507,665	229,006	49,533	4,004,442
1958	3,021,093	160,257	17,173	48,837	501,591	277,373	48,403	4,074,727

n.a. Not Available.

[1] Data not available for Alaskan airlines in 1939. All-Cargo airlines began operations in fourth quarter of 1949.
Local Service operations initiated in 1945.
Helicopter operations started in 1947, passenger service began in 1953.

[2] Express and freight combined for all carriers in 1939 and for Alaskan carriers in all years.

[3] Revenue Ton Mile data for items other than passenger ton miles for International and Overseas carriers not available for 1939, hence total does not reflect these items.

[4] Foreign mail carried by International and Overseas airlines is included in Excess Baggage. Therefore, it is also reflected in Consolidated Industry Excess Baggage data.

[5] See definitions, p. 3.

[6] Passenger ton miles for years prior to 1957 were revised to conform with "standard" passenger weights as prescribed by the CAB effective Jan. 1, 1957.

[7] Foreign mail, Seaboard and Western.

AIRCRAFT OPERATIONS AT FAA AIRPORT TOWERS

1950-1958 (In Thousands)

Type of Flight Operation	1950	1951	1952	1953	1954	1955	1956	1957	1958
Military	2,384	2,852	2,983	3,712	4,409	4,957	5,472	5,910	5,565
General Aviation	9,585	9,618	7,965	7,719	8,015	8,540	10,021	12,129	14,037
Air Carrier	4,002	4,556	4,866	5,384	5,521	5,983	6,553	7,112	6,998
Total	15,971	17,026	15,814	16,815	17,945	19,480	22,046	25,151	26,600
% Air Carrier of Total	25.1	26.8	30.8	32.0	30.8	30.7	29.7	28.3	26.3

Air Carriers include scheduled and non scheduled operations. Each landing is counted as an operation as is also each take off.

OPERATING REVENUES

U. S. Scheduled Airline Industry

(For Selected Years, In Thousands of Dollars)

THIS TABLE SHOWS THE DOLLARS OF SALES THE SCHEDULED AIRLINES EARNED FOR THE VARIOUS SERVICES THEY RENDER

		U. S. Mail		Public Service				
	Passenger	Priority	Non-Priority	Revenue[1]	Express	Freight	Other[4]	Total
Domestic Trunk Airlines								
1939	34,484	18,436	.....	.....	.....	1,605	1,002	55,527
1949	378,113	45,031	.....	.....	8,957	18,323	9,359	459,783
1955	1,021,855	24,230	2,708	3,192	19,405	39,605	22,353	1,133,348
1956	1,142,197	28,937	2,654	2,609	18,101	42,173	26,160	1,262,831
1957	1,287,172	31,002	2,760	1,182	14,667	49,870	32,961	1,419,614
1958 p	1,362,791	33,052	3,076	2,373	16,096	57,336	38,295	1,513,019
Local Service Airlines[2]								
1939	.....	.....	.....	.....	.....	.....	.....	.....
1949	7,362	13,533	.....	.....	114	138	271	21,418
1955	32,840	1,084	101	20,923	665	556	1,281	57,450
1956	40,166	1,004	102	23,211	775	750	1,704	67,712
1957	47,464	1,108	103	29,651	725	1,049	2,039	82,139
1958 p	56,421	1,254	116	32,523	796	1,183	2,361	94,654
Territorial Airlines								
1939	359	45	.....	.....	.....	14[3]	3	421
1949	3,799	247	.....	.....	145	333	254	4,778
1955	5,686	48	.....	291	.....	752	337	7,114
1956	6,042	51	1	288	.....	782	266	7,430
1957	6,975	51	2	72	.....	781	479	8,360
1958 p	7,066	55	.....	109	.....	819	1,347	9,396
Helicopter Airlines[2]								
1939	.....	.....	.....	.....	.....	.....	.....	.....
1949	.....	522	.....	.....	.....	.....	.....	522
1955	208	250	.....	2,710	100	23	64	3,355
1956	438	234	.....	2,833	115	28	63	3,711
1957	968	237	.....	3,567	101	36	123	5,032
1958 p	1,460	214	.....	4,091	102	31	117	6,015

See Footnotes at Bottom of Page 18

Operating Revenues
(continued)

	Passenger	U. S. Mail: Priority	U. S. Mail: Non-Priority	Public Service Revenue[1]	Express	Freight	Other[4]	Total
International and Overseas Airlines								
1939	6,156	11,066	.....	.....	.....	613	1,818	19,653
1949	158,480	75,197	.....	.....	20,023	2,105	18,350	274,155
1955	294,828	25,639	.....	1,583	77	31,853	30,324	384,304
1956	342,553	26,926	.....	8,308	82	36,683	38,113	452,665
1957	377,655	28,365	.....	555	80	41,475	39,818	487,948
1958 [p]	386,084	32,655	.....	.....	147	43,708	43,963	506,557
Alaskan Airlines[2]								
1939	.....	.....	.....	.....	.....	.....	.....	.....
1949	2,188	2,122	.....	.....	.....	547[3]	3,639	8,496
1955	8,162	2,333	.....	5,618	.....	2,464	3,747	22,324
1956	10,200	2,477	.....	6,241	.....	2,754	7,680	29,352
1957	11,263	2,662	.....	6,369	.....	2,651	4,063	27,008
1958 [p]	12,522	2,918	.....	6,854	.....	2,701	3,925	28,920
All-Cargo Airlines[2]								
1939	.....	.....	.....	.....	.....	.....	.....	.....
1949	.....	.....	.....	.....	.....	1,810	300	2,110
1955	.....	60	.....	.....	.....	18,640	8,335	27,035
1956	.....	144	220	.....	447	25,564	26,485	52,860
1957	.....	189	263	.....	545	29,281	55,050	85,328
1958 [p]	.....	486	89	.....	300	23,171	54,862	78,908
CONSOLIDATED INDUSTRY[5]								
1939	40,999	29,547	.....	.....	.....	2,232[3]	2,823	75,601
1949	549,942	136,652	.....	.....	29,239	23,256	32,173	771,262
1955	1,363,579	53,644	2,809	34,317	20,247	93,893	66,441	1,634,930
1956	1,541,596	59,773	2,977	43,490	19,520	108,734	100,471	1,876,561
1957	1,731,497	63,614	3,128	41,396	16,118	125,143	134,533	2,115,429
1958 [p] [5]	1,826,344	70,634	3,281	45,950	17,441	128,949	144,870	2,237,469

[p] Preliminary.

[1] Prior to October 1, 1953, public service revenues were not reported separately.

[2] Local Service operations were initiated in 1945; Helicopter operations in 1947; and All-Cargo airlines in the Fourth quarter of 1949. Data not available for Alaskan Airlines in 1939.

[3] Express and Freight revenues are combined for the Territorial and the Alaskan carriers. They are reflected in freight totals.

[4] Other revenues include revenues from excess baggage and from charter operations, and incidental revenues.

[5] Revenues included for Seaboard and Western are for the twelve months ended September 30, 1958.

DISTRIBUTION OF OPERATING EXPENSES

U. S. Scheduled Airline Industry

(For Selected Years, In Thousands of Dollars)

THIS TABLE SHOWS HOW THE AIRLINES SPEND THEIR DOLLARS TO INSURE FAST, SAFE, ECONOMICAL FLYING OPERATIONS AND EFFICIENT PASSENGER AND CARGO HANDLING

Explanation of New Classification of Operating Expenses

The classification of operating expenses is different from that used in prior years. Owing to a revision of the form on which the carriers report to CAB it is not feasible to bring forward beyond 1956 the expense tables previously published in Facts and Figures. For this reason the data shown herein for years prior to 1956 were recast for this publication into the format of the new reporting system—insofar as it was feasible to do so. The data shown for 1957 and 1958 are as reported by the carriers. Although the "matching" of prior years' data with 1957 and 1958 is not perfect, it is considered adequate for general use where precision is not required.

The classifications of expenses employed in past issues of "Facts and Figures" were grouped as follows to fit the new format:

NEW CLASSIFICATION	OLD CLASSIFICATION
Flying operations	Flying operations
Maintenance	Direct maintenance—flight equipment Ground and indirect maintenance
Passenger service	Passenger service
Aircraft and traffic servicing	Ground operations
Promotion and sales	Traffic and sales Advertising and publicity
General and administrative	General and administrative
Depreciation and amortization	Depreciation—flight equipment Depreciation—ground equipment

As pointed out above, this method of matching accounts is not perfect. The figures for 1957 and 1958 differ in the following respects from those shown for 1956 and earlier:

1) "Amortization of other deferred charges," dispersed throughout the accounts for 1956 and before, is grouped in "Depreciation and amortization" after 1956.
2) "Legal fees and expenses," dispersed in several accounts prior to 1957 is all in "General and administrative."
3) Payroll taxes and employee welfare insurance, included in "General and administrative" before 1957 are distributed to other appropriate accounts.
4) Airport ticket office expenses, included in "Promotion and Sales" for earlier years is under "Aircraft and Traffic Servicing."
5) Route extension and development expenses, not classified as operating expense in prior years, are included in "Depreciation and Amortization," after 1956.

	Flying Operations	Maintenance	General Services & Administration: Passenger Service	Aircraft & Traffic Servicing	Promotion & Sales	Administrative	Total G. S. & A.	Depreciation & Amortization	Total Operating Expenses
Domestic Trunk Airlines									
1939	15,682	8,191	1,844	8,934	6,205	4,011	20,994	5,667	50,941[3]
1949	119,961	83,674	27,778	66,623	59,195	30,894	184,490	47,033	435,157
1955	302,591	196,320	72,996	133,274	134,706	68,473	409,449	101,709	1,010,069
1956	340,670	239,530	83,953	152,928	159,366	79,462	475,709	106,321	1,162,230
1957	434,842	270,328	95,505	217,208	157,561	55,164	525,438	146,968	1,377,576
1958[p]	436,953	285,564	101,361	230,846	165,772	58,182	556,161	139,808	1,418,486

See Footnotes at Bottom of Page 21

Distribution of Operating Expenses *(continued)*

	Flying Operations	Maintenance	General Services & Administration: Passenger Service	Aircraft & Traffic Servicing	Promotion & Sales	Administrative	Total G. S. & A.	Depreciation & Amortization	Total Operating Expenses
Local Service Airlines									
1939[1]	------	------	------	------	------	------	------	------	------
1949	6,336	4,537	825	3,743	2,405	1,792	8,765	2,233	21,871
1955	18,080	10,384	2,687	9,563	9,287	4,485	26,022	2,278	56,764
1956	21,616	12,610	3,385	11,187	11,399	5,382	31,353	2,714	68,293
1957	26,509	16,418	4,028	21,160	6,089	4,938	36,215	3,758	82,900
1958[p]	29,265	18,686	4,527	24,023	6,998	5,530	41,078	4,274	93,303
Territorial Airlines									
1939	127	90	1	38	34	65	138	96	451
1949	1,091	900	165	922	628	682	2,397	444	4,832
1955	1,942	1,278	245	1,258	1,045	964	3,512	603	7,335
1956	2,033	1,259	252	1,317	1,182	848	3,599	416	7,307
1957	2,212	1,422	278	1,521	1,265	868	3,932	515	8,081
1958[p]	2,502	1,699	414	1,672	1,283	1,025	4,394	659	9,254
Helicopter Airlines									
1939[1]	------	------	------	------	------	------	------	------	------
1949	151	133	------	50	2	63	115	111	510
1955	614	871	21	425	180	393	1,019	451	2,955
1956	697	981	21	544	312	496	1,373	605	3,656
1957	1,108	1,381	------	------	------	------	1,765[3]	911	5,164
1958[p]	1,410	1,646	------	------	------	------	1,972[3]	948	5,976
International & Overseas Airlines									
1939	------	------	------	------	------	------	------	------	17,266[3]
1949	72,347	47,245	14,617	33,168	35,731	22,600	106,116	27,155	252,863
1955	108,501	58,975	26,773	46,990	61,980	31,291	167,034	31,094	365,604
1956	125,613	72,069	31,053	51,583	70,822	33,808	187,266	34,593	419,541
1957	142,944	72,326	32,519	67,187	70,902	24,631	195,239	50,359	460,868
1958[p]	154,912	79,904	35,527	72,550	75,802	24,878	211,138	50,694	496,648

See Footnotes at Bottom of Page 21

Distribution of Operating Expenses *(continued)*

	Flying Operations	Maintenance	General Services & Administration: Passenger Service	Aircraft & Traffic Servicing	Promotion & Sales	Administrative	Total G. S. & A.	Depreciation & Amortization	Total Operating Expenses
Alaskan Airlines									
1939[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
1949	3,440	2,343	370	988	714	1,180	3,252	1,143	10,178
1955	7,191	5,273	773	2,701	1,593	1,519	6,586	1,120	21,706[4]
1956	9,959	5,744	964	3,702	1,831	1,894	8,391	1,364	27,166[4]
1957	8,669	6,215	854	2,779	1,042	853	10,065[4]	1,646	26,595
1958[p]	8,998	6,383	921	3,281	1,067	1,185	10,626[4]	1,914	27,921
All-Cargo Airlines									
1939[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
1949	966	367	.....	206	453	215	874	74	2,281
1955	10,635	5,287	267	3,896	2,081	2,103	8,347	2,074	26,343
1956	21,677	11,662	1,614	6,353	3,883	3,454	15,304	3,155	53,879[4]
1957	36,563	18,969	3,618	12,450	4,064	4,395	25,203[4]	8,998	89,734
1958 [p] [6]	32,820	18,448	2,697	8,887	2,661	4,251	19,241[4]	9,445	79,954
CONSOLIDATED INDUSTRY									
1939[1]	15,809	8,281	1,345	8,972	6,239	4,076	21,132	5,763	68,658[5]
1949	204,292	139,199	43,755	105,700	99,127	57,426	306,008	78,193	727,692
1955	449,554	278,388	103,762	198,107	210,872	109,228	621,969	139,329	1,490,776[4]
1956	522,265	343,855	121,242	227,614	248,795	125,344	722,995	149,168	1,742,072[4]
1957	652,847	387,060	136,802	322,305	240,923	90,848	797,855[4]	213,156	2,050,918
1958 [p] [6]	666,860	412,330	145,447	341,259	253,583	95,051	844,610[4]	207,742	2,131,542

[1] Data not available for Alaskan airlines in 1939. All-Cargo airlines began certificated operations in fourth quarter of 1949. Local Service Operations initiated in 1945. Helicopter operations started in 1947.

[2] Colonial airlines included in the trunkline total for 1939 but not in the detail.

[3] Detailed expense data not available.

[4] Total is greater than sum of individual expense categories since segregation of expenses is not reported by some classes of carriers.

[5] Total for 1939 includes international carriers, not included in the detail. See note 3.

[6] Data included for Seaboard and Western are for the 12 months ended Sept. 30, 1958.

[p] Preliminary.

SUMMARY OF PROFIT OR LOSS

U. S. Scheduled Airline Industry

(For Selected Years, In Thousands of Dollars)

THIS TABLE SHOWS THE EARNINGS OF AIRLINES WHICH WERE AVAILABLE FOR DIVIDENDS TO STOCKHOLDERS OR FOR RETENTION IN THE BUSINESS. IT ALSO SHOWS THESE DOLLARS AS A PER CENT OF SALES AND THE RATIO OF TOTAL RETURN TO INVESTMENT

	Total Operating Revenues	Total Operating Expenses	Net Operating Income	Interest on Long-Term Debt	Other Non-Operating Income (Net)	Income Taxes	Net Profit or Loss[2]	Rate of Return on Investment[3] (%)	Profit Margin on Sales[4] (%)
Domestic Trunk Airlines									
1939	55,527	50,941	4,586	n.a.	n.a.	n.a.	n.a.	.....	.....
1949	459,783	435,157	24,626	4,466	503	7,285	13,378	.....	.....
1955	1,133,348	1,010,069	123,279	6,540	16,388	70,024	63,103	11.8	5.6
1956	1,262,831	1,162,230	100,601	9,964	23,917	56,842	57,712	9.4	4.6
1957	1,419,614	1,377,576	42,036	16,201	18,651	23,076	26,988	4.9	1.9
1958 p	1,513,019	1,418,486	94,533	24,309	19,859	43,842	44,709	6.6	3.0
Local Service Airlines[1]									
1939	.....	.....	.....	.....	.....	.....	.....	.....	.....
1949	21,418	21,871	(453)	80	(749)	168	(1,451)	.....	.....
1955	57,450	56,764	686	219	369	484	352	2.7	0.6
1956	67,712	68,293	(581)	376	106	(50)	(801)	(—)	(—)
1957	82,139	82,900	(760)	224	(472)	(51)	(1,153)	(—)	(—)
1958 p	94,654	93,303	1,351	824	282	348	2,306	15.5	2.4
Territorial Airlines									
1939	421	451	(30)	n.a.	n.a.	n.a.	n.a.	.....	.....
1949	4,778	4,832	(54)	9	(69)	57	(189)	.....	.....
1955	7,114	7,335	(221)	106	210	8	(125)	(—)	(—)
1956	7,430	7,307	123	97	(14)	.....	12	3.3	0.2
1957	8,360	8,081	278	109	376	53	267	11.0	3.2
1958 p	9,396	9,254	142	163	(48)	1	(70)	4.3	(—)
Helicopter Airlines[1]									
1939	.....	.....	.....	.....	.....	.....	.....	.....	.....
1949	522	510	12	.....	(28)	.....	(16)	.....	.....
1955	3,355	2,955	400	11	155	202	342	10.0	10.2
1956	3,711	3,656	55	23	(63)	8	(39)	(—)	(—)
1957	5,032	5,164	(131)	64	19	(55)	(111)	(—)	(—)
1958 p	6,015	5,976	39	96	19	(8)	(30)	1.3	(—)

See Footnotes at Bottom of Page 23

Summary of Profit or Loss
(continued)

	Total Operating Revenues	Total Operating Expenses	Net Operating Income	Interest on Long-Term Debt	Other Non-Operating Income (Net)	Income Taxes	Net Profit or Loss[2]	Rate of Return on Investment[3] (%)	Profit Margin on Sales[4] (%)
International and Overseas Airlines									
1939	19,653	17,266	2,387	n.a.	n.a.	n.a.	n.a.	.....	.....
1949	274,155	252,863	21,292	736	(11,740)	1,362	7,454	.....	.....
1955	384,304	365,604	18,700	1,700	6,754	10,320	13,434	6.3	3.5
1956	452,665	419,541	33,124	3,000	8,169	17,792	20,501	8.2	4.5
1957	487,665	419,541	33,124	3,000	8,619	13,252	19,520	7.8	4.0
1958 p	506,557	496,648	9,909	5,792	7,300	5,441	6,793	3.7	1.3
Alaskan Airlines[1]									
1939	.....	.....	.....	.....	.....	.....	.....	.....	.....
1949	8,496	10,178	(1,682)	38	(97)	28	(1,789)	.....	.....
1955	22,324	21,706	518	76	228	334	436	8.3	2.0
1956	29,352	27,166	2,186	222	(98)	870	996	15.1	3.4
1957	27,008	26,595	413	362	729	121	900	11.1	3.3
1958 p	28,920	27,921	999	415	355	631	882	9.6	3.0
All-Cargo Airlines[1]									
1939	.....	.....	.....	.....	.....	.....	.....	.....	.....
1949	2,110	2,281	(171)	.....	18	2	(155)	.....	.....
1955	27,035	26,343	692	561	1,132	80	1,163	9.4	4.4
1956	52,860	53,879	(1,019)	488	4,539	1,210	1,822	7.0	3.4
1957	85,328	89,734	(4,406)	1,526	4,022	285	(2,207)	(—)	(—)
1958 p	78,908	79,954	(1,046)	1,669	(212)	2,335	(1,676)	(—)	(—)
CONSOLIDATED INDUSTRY									
1939	75,601	68,658	6,943	n.a.	n.a.	n.a.	n.a.	.....	.....
1949	771,262	727,692	43,570	5,329	(12,106)	8,902	17,235	.....	.....
1955	1,634,930	1,490,776	144,154	9,213	25,236	81,452	78,725	10.8	4.8
1956	1,876,561	1,742,072	134,489	14,170	36,556	76,672	30,203	8.8	4.3
1957	2,115,429	2,050,918	64,511	23,368	31,665	36,683	44,202	5.1	2.1
1958 p [5]	2,237,469	2,131,542	105,927	33,268	27,555	52,590	52,914	5.8	2.4

n.a. Not Available.

[1] Data not available for Alaskan airlines in 1939. All-Cargo airlines began operations in fourth quarter of 1949. Local Service operations initiated in 1945. Helicopter operations started in 1947.
Net profit or loss for 1957 and 1958 is shown after "Special Items," which are not included in the detail. Therefore, the items do not add to the profit figures shown.

[3] Net income before interest and after taxes as percent of average net worth and long-term debt.

[4] Profit as percent of revenues.

[5] Data for Seaboard and Western are for the 12 months ended Sept. 30, 1958.

p Preliminary.

ASSETS, LIABILITIES AND STOCKHOLDERS' EQUITY

U. S. Scheduled Airline Industry

(As of Dec. 31, for Selected Years, In Thousands of Dollars)

THIS TABLE SHOWS WHAT THE SCHEDULED AIRLINES OWN AND WHAT THEY OWE

	1939	1949	1955	1956	1957	(Sept. 30) 1958
Domestic Trunk Airlines[b]						
Assets						
Current Assets	23,592	175,471	436,609	439,827	457,611	456,748
Investments and Special Funds	2,585	41,370	47,405	146,147	127,943	163,496
Flight Equipment		329,915	890,095	1,097,044	1,363,767	1,489,783
Reserve for Depreciation and Maintenance		141,296	478,482	553,793	639,019	719,249
Ground Property and Equipment	17,412a	91,837	154,104	180,613	206,452	223,809
Reserve for Depreciation		35,271	77,622	89,217	101,001	112,489
Other Property		7,618	28,402	41,359	49,667	77,549
Deferred Charges	1,754	15,658	9,459	13,264	23,541	28,247
Other Assets	708	1,640	1,175	6,308	.....	.....
Total Assets	46,051	486,942	1,011,145	1,281,552	1,488,961	1,607,894
Liabilities and Equity						
Current Liabilities	9,316	98,428	276,839	333,876	328,844	322,098
Long-Term Debt	4,002	148,017	198,916	324,071	469,486	534,644
Other Non-Current Liabilities	.....	.....	.....	.....	1,224	19,582
Operating Reserves	257	3,636	8,365	10,490	.....	.....
Deferred Credits	721	12,724	22,886	37,646	51,480	75,288
Stockholders' Equity—Net of Treasury Stock	31,755	224,137	504,139	575,469	637,927	656,282
Preferred Stock	621	60,827	29,789	16,592	15,805	14,434
Common Stock	21,385	62,884	80,172	88,555	108,502	109,896
Other Paid-In Capital	12,903	63,434	141,839	178,058	215,292	221,383
Retained Earnings	(3,154)	36,992	252,339	291,872	298,328	310,569
Total Liabilities and Equity	46,051	486,942	1,011,145	1,281,552	1,488,961	1,607,894
Local Service Airlines						
Assets						
Current Assets	.....	5,648	12,970	14,873	16,512	17,522
Investments and Special Funds	.....	684	950	1,438	3,028	3,358
Flight Equipment	.....	7,926	21,451	26,105	32,949	37,335
Reserve for Depreciation and Maintenance	.....	3,780	11,096	12,628	16,825	19,202
Ground Property and Equipment	.....	2,242	5,122	5,795	6,544	7,035
Reserve for Depreciation	.....	869	2,555	2,949	3,556	4,080
Other Property	.....	321	682	3,692	607	1,620
Deferred Charges	.....	2,007	885	1,564	1,931	2,141
Other Assets	.....	75	2	35	.....	.....
Total Assets	.....	14,254	28,411	37,925	41,190	45,729
Liabilities and Equity						
Current Liabilities	.....	4,449	12,461	17,431	22,002	23,627
Long-Term Debt	.....	1,578	4,013	7,800	8,656	9,733
Other Non-Current Liabilities	.....	.....	.....	.....	205	349
Operating Reserves	.....	170	783	1,138	.....	.....
Deferred Credits	.....	100	21	303	264	198
Stockholders' Equity—Net of Treasury Stock	.....	7,957	11,133	11,253	10,063	11,822
Preferred Stock	.....	226	412	920	163	163
Common Stock	.....	5,191	6,345	5,871	6,776	7,359
Other Paid-In Capital	.....	4,265	4,324	4,891	4,863	5,669
Retained Earnings	.....	(1,725)	52	(429)	(1,739)	(1,369)
Total Liabilities and Equity	.....	14,254	28,411	37,925	41,190	45,729

a. Net property and equipment.
b. Balance sheet data for domestic trunk airlines reflect their international as well as domestic operations.

Assets, Liabilities and Stockholders' Equity
(continued)

	1939	1949	1955	1956	1957	(Sept. 30) 1958
Territorial Airlines						
Assets						
Current Assets	100	1,333	1,068	1,241	1,964	2,246
Investments and Special Funds	72	272	19	15	113	21
Flight Equipment		2,220	5,744	6,057	5,932	7,751
Reserve for Depreciation and Maintenance		1,331	2,839	2,930	3,230	3,646
Ground Property and Equipment	333a	963	1,177	1,276	1,354	1,481
Reserve for Depreciation		528	749	847	945	1,025
Other Property		132	41	17	133	59
Deferred Charges	38	156	180	169	182	358
Other Assets	.....	25	.....	.....	.....	.....
Total Assets	543	3,242	4,641	4,998	5,503	7,245
Liabilities and Equity						
Current Liabilities	18	763	1,329	1,520	2,011	2,399
Long-Term Debt	62	.....	1,835	1,702	1,635	2,758
Other Non-Current Liabilities	.....	.....	.....	.....	.....	.....
Operating Reserves	15	10	20	41	.....	.....
Deferred Credits	.....	81	1	68	23	17
Stockholders' Equity—Net of Treasury Stock	448	2,388	1,456	1,667	1,834	2,071
Preferred Stock	.....	.....	.....	.....	.....	.....
Common Stock	448	2,649	1,981	1,981	1,981	1,981
Other Paid-In Capital	9	132	874	832	832	832
Retained Earnings	(9)	(393)	(1,399)	(1,146)	(979)	(742)
Total Liabilities and Equity	543	3,242	4,641	4,998	5,503	7,245
Helicopter Airlines						
Assets						
Current Assets	.....	1	14	71	1	32
Investments and Special Funds	.....	138	163	196	302	503
Flight Equipment	.....	59	.....	.....	.....	.....
Reserve for Depreciation and Maintenance	.....	723	4,253	5,476	5,798	6,551
Ground Property and Equipment	.....	174	2,385	2,307	2,168	2,119
Reserve for Depreciation	.....	.....	321	290	27	52
Other Property	.....	486	2,508	3,878	5,170	4,848
Deferred Charges	.....	165	1,313	1,645	2,336	1,428
Other Assets	.....	42	312	576	777	796
Total Assets	.....	12	137	197	311	371
Liabilities and Equity						
Current Liabilities	.....	69	591	735	961	1,264
Long-Term Debt	.....	.....	87	817	1,033	1,467
Other Non-Current Liabilities	.....	.....	.....	.....	.....	1
Operating Reserves	.....	.....	31	45	.....	.....
Deferred Credits	.....	.....	25	69	109	115
Stockholders' Equity—Net of Treasury Stock	.....	654	3,519	3,810	3,695	3,704
Preferred Stock	.....	320	.....	.....	.....	.....
Common Stock	.....	375	677	702	734	771
Other Paid-In Capital	.....	.....	2,201	2,435	2,546	2,685
Retained Earnings	.....	(41)	641	673	415	248
Total Liabilities and Equity	.....	723	4,253	5,476	5,798	6,551
International and Overseas Airlines[b]						
Assets						
Current Assets	7,913	68,903	109,019	111,560	102,202	109,329
Investments and Special Funds	790	8,448	33,230	37,987	52,992	80,446
Flight Equipment		143,009	216,737	265,785	276,758	280,461
Reserve for Depreciation and Maintenance		46,837	99,787	114,074	132,185	146,385
Ground Property and Equipment	16,839a	22,649	29,595	31,813	34,351	35,278
Reserve for Depreciation		10,730	18,424	18,614	20,741	22,396
Other Property		2,536	2,719	2,450	4,239	7,095
Deferred Charges	327	25,276	3,766	4,440	4,413	6,193
Other Assets	4,486	.....	.....	.....	.....	.....
Total Assets	30,355	213,254	276,855	321,347	322,029	350,021

(International and Overseas Airlines continued on next page)

See Footnotes at Bottom of Page 24

Assets, Liabilities and Stockholders' Equity *(continued)*

	1939	1949	1955	1956	1957	(Sept. 30) 1958
International and Overseas Airlines						
Liabilities and Equity						
Current Liabilities	6,169	32,483	80,041	92,352	87,424	106,621
Long-Term Debt	2,115	43,307	60,481	83,406	85,653	92,688
Other Non-Current Liabilities	767	.....	.....	.....	1,011	880
Operating Reserves	.....	5,333	3,319	3,584	.....	.....
Deferred Credits	527	18,407	5,846	6,058	6,648	7,123
Stockholders' Equity—Net of Treasury Stock	20,777	113,724	127,168	135,947	141,293	142,709
Preferred Stock	.....	150	150	.....	.....	.....
Common Stock	7,060	12,755	13,622	13,792	16,310	16,346
Other Paid-In Capital	10,458	77,883	63,120	63,460	62,129	62,420
Total Retained Earnings	3,259	22,936	50,276	59,119	62,854	63,943
Total Liabilities and Equity	30,355	213,254	276,855	321,347	322,029	350,021
Alaskan Airlines						
Assets						
Current Assets	.....	2,408	5,600	7,129	7,682	8,819
Investments and Special Funds	.....	5	248	532	957	885
Flight Equipment	.....	4,431	6,906	11,126	13,668	15,243
Reserve for Depreciation and Maintenance	.....	2,483	4,981	5,539	6,080	6,847
Ground Property and Equipment	.....	1,407	3,808	4,201	4,843	4,877
Reserve for Depreciation	.....	544	1,531	1,808	2,138	2,335
Other Property	.....	207	163	400	313	1,102
Deferred Charges	.....	348	358	422	624	774
Other Assets	.....	214	138	134	.....	.....
Total Assets	.....	5,993	10,709	16,597	19,869	22,518
Liabilities and Equity						
Current Liabilities	.....	2,530	4,002	6,170	7,084	7,939
Long-Term Debt	.....	491	765	3,360	4,942	5,938
Other Non-Current Liabilities	.....	.....	.....	.....	25	42
Operating Reserves	.....	141	457	276	.....	.....
Deferred Credits	.....	65	200	42	104	209
Stockholders' Equity—Net of Treasury Stock	.....	2,766	5,285	6,749	7,714	8,390
Preferred Stock	.....	7	.....	.....	.....	279
Common Stock	.....	2,151	2,950	3,152	3,315	3,497
Other Paid-In Capital	.....	2,917	3,605	3,613	3,629	3,622
Retained Earnings	.....	(2,309)	(1,270)	(16)	770	992
Total Liabilities and Equity	.....	5,993	10,709	16,597	19,869	22,518
All-Cargo Airlines						
Assets						
Current Assets	.....	2,600	11,716	21,224	19,589	22,581
Investments and Special Funds	.....	53	2,850	17,244	4,629	3,714
Flight Equipment	.....	2,293	24,143	31,540	65,449	59,989
Reserve for Depreciation and Maintenance	.....	589	7,575	9,188	17,500	18,743
Ground Property and Equipment	.....	969	2,753	4,666	5,578	5,294
Reserve for Depreciation	.....	467	1,354	1,833	2,382	2,484
Other Property	.....	23	399	3,028	2,682	2,879
Deferred Charges	.....	365	410	2,706	5,122	4,940
Other Assets	.....	.....	140	281	.....	.....
Total Assets	.....	5,247	33,482	69,668	83,167	78,170
Liabilities and Equity						
Current Liabilities	.....	1,568	10,759	19,301	25,991	22,153
Long-Term Debt	.....	1,431	7,598	16,813	25,121	23,100
Other Non-Current Liabilities	.....	.....	.....	.....	449	1,312
Operating Reserves	.....	101	1,808	2,311	.....	.....
Deferred Credits	.....	17	235	2,277	3,257	3,998
Stockholders' Equity—Net of Treasury Stock	.....	2,130	13,082	28,966	28,349	27,607
Preferred Stock	.....	.....	1,211	1,441	1,437	1,436
Common Stock	.....	4,169	5,466	6,863	8,237	8,532
Other Paid-In Capital	.....	3,135	4,304	14,341	15,701	17,649
Retained Earnings	.....	(5,174	2,101	6,321	2,974	(10)
Total Liabilities and Equity	.....	5,247	33,482	69,668	83,167	78,170

See Footnotes at Bottom of Page 24

Assets, Liabilities and Stockholders' Equity *(continued)*

	1939	1949	1955	1956	1957	(Sept. 30) 1958
Consolidated Industry						
Assets						
Current Assets	31,605	256,537	579,367	598,161	607,728	619,364
Investments and Special Funds	3,447	50,832	85,023	203,653	189,689	251,972
Flight Equipment		490,280	1,167,584	1,441,535	1,763,693	1,895,410
Reserve for Depreciation and Maintenance		196,481	606,073	699,797	817,175	915,500
Ground Property and Equipment	34,584a	120,109	196,871	228,940	259,899	278,570
Reserve for Depreciation		48,421	102,372	115,465	131,074	145,180
Other Property		10,838	32,420	51,017	57,642	90,336
Deferred Charges	2,119	43,948	15,221	22,761	36,115	43,156
Other Assets	5,194	2,013	1,455	6,758	.....	.....
Total Assets	76,949	729,655	1,369,496	1,737,563	1,966,517	2,118,128
Liabilities and Equity						
Current Liabilities	15,503	140,290	386,022	471,385	474,317	486,101
Long-Term Debt	6,179	194,824	273,695	437,969	596,526	670,328
Other Non-Current Liabilities	767	.....	.....	.....	2,914	22,166
Operating Reserves	272	9,391	14,783	17,885	.....	.....
Deferred Credits	1,248	31,394	29,214	46,463	61,885	86,948
Stockholders' Equity—Net of Treasury Stock	52,980	353,756	665,782	763,861	830,875	852,585
Preferred Stock	621	61,530	31,562	18,953	17,405	16,312
Common Stock	28,893	90,174	111,213	120,916	145,855	148,382
Other Paid-In Capital	23,370	151,766	220,267	267,630	304,992	314,260
Retained Earnings	96	50,286	302,740	356,394	362,623	373,631
Total Liabilities and Equity	76,949	729,655	1,369,496	1,737,563	1,966,517	2,118,128

See Footnotes at Bottom of Page 24

DOMESTIC INTERCITY PASSENGER MILES

(For Selected Years, In Millions)

	1939	1949	1955	1956	1957	1958
Railroad Travel:[1]						
First Class	7,527	9,349	6,440	6,275	5,185	4,249
Coach	11,180	20,310	17,329	17,105	16,365	14,300[5]
Air Travel:[2]						
First Class	654	6,454	13,025	14,202	15,736	15,180
Coach	.....	251	6,716	8,074	9,510	10,076
Motor Bus Travel[3]	9,100	22,411	16,562	16,409	14,886	14,588[5]
Total Common Carriers	28,461	58,775	60,072	62,065	61,682	58,393
Airline Share of Total	2.3	11.4	32.9	35.9	40.9	43.3
Private Automobile, Intercity[4]	234,700	376,313	585,800	617,700	637,800	650,000[5]
Total Common Carrier and Auto	263,161	435,088	645,872	679,765	699,482	708,393
Airline Share of Total Intercity Travel	0.2	1.5	3.1	3.3	3.6	3.6

[1] I.C.C., Statistics of Railways in the United States, 1958, Statement M-250.
[2] 1939, CAB, Annual Airline Statistics; 1949, CAB, Recurrent Reports on Traffic Statistics; 1955-1957, CAB, Monthly Reports on Air Carrier Traffic; 1958, Carrier Reports to CAB.
[3] 1939, I.C.C. Statement No. 531, Jan. 1953; 1949-1957, I.C.C., Transport Economics, Dec. 1958.
[4] 1939, NAMBO, Bus Facts, 20th Edition; 1949-1956, I.C.C., Transport Economics, May 1956; 1958 estimated on basis of gasoline sales.
[5] Estimated.

REVENUE PASSENGERS CARRIED

U. S. Scheduled Airline Industry

(For Selected Years, In Thousands of Passengers)

	1939	1949	1951	1952	1953	1954	1955	1956	1957[2]	1958[2]
Domestic Trunk Airlines	1,713	14,021	20,621	22,759	26,137	29,526	34,511	37,598	40,270	39,513
Local Service Airlines	.....	678	1,481	1,736	2,032	2,423	2,897	3,453	3,943	4,265
Territorial Airlines	22	382	550	515	553	561	591	627	589	572
Helicopter Airlines	.....	.....	.....	.....	1	9	29	62	148	228
International and Overseas Airlines	129	1,520	2,038	2,362	2,682	2,888	3,376	3,888	4,065	4,182
Alaskan Airlines[1]	n.a.	122	157	194	220	225	264	315	309	315
TOTAL SCHEDULED AIRLINE INDUSTRY	1,864	16,723	24,847	27,566	31,625	35,632	41,623	45,943	49,339	49,075
AVERAGE LENGTH OF HAUL (Statute Miles)										
Domestic Trunk Airlines	397	469	495	533	547	550	557	576	608	618
International and Overseas Airlines	557	1,351	1,275	1,278	1,261	1,296	1,307	1,315	1,415	1,429

[1] Alaskan data for 1949 include charter flights. 1939 not available.

[2] Passengers for 1957 and 1958 were reported on a basis which yielded slightly lower figures than the basis used in prior years. This accounts in part for the typical increase of average length of haul in 1957 as compared to 1956.

AVERAGE REVENUE PER PASSENGER MILE

Intercity Common Carriers

(For Selected Years, In Cents per Mile)

	1939	1946	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Domestic Scheduled Airlines[1]												
Coach or Toursist	.....	.....	3.96	4.10	4.45	4.18	4.13	4.34	4.32	4.29	4.25	4.52
All Services	5.28	4.62	5.75	5.54	5.59	5.54	5.43	5.37	5.32	5.28	5.25	5.58
International Scheduled Airlines												
Coach or Toursist	.....	.....	.....	.....	.....	.....	5.77	5.83	n.a.	n.a.	5.77	5.66
All Services	8.57	8.31	7.72	7.28	7.13	7.04	6.88	6.79	6.68	6.70	6.57	6.52
Railroads, Class I[4]												
First Class[3]	2.33	2.45	3.14	3.25	3.27	3.35	3.38	3.35	3.31	3.39	3.68	3.72
Coach	1.80	1.82	2.41	2.47	2.47	2.53	2.53	2.50	2.47	2.56	2.71	2.75
Intercity Motor Buses, Class I	1.56	1.66	1.84	1.88	1.94	2.02	2.05	2.07	2.05	2.13	2.26	2.37[2]

[1] Trunk airlines.

[2] Estimated.

[3] Does not include payments to Pullman Company for seat, berth, etc.

[4] Excludes commutation.

n.a. Not available.

Note: Average passenger fare is derived by dividing passenger revenue by revenue passenger miles.

AIRCRAFT OWNED AND ON ORDER

By U. S. Scheduled Airline Industry
(For Selected Years)

THIS TABLE SHOWS HOW THE SIZE AND TYPE OF AIRCRAFT USED BY THE SCHEDULED AIRLINES HAS IMPROVED OVER THE YEARS AND HOW THE SCHEDULED AIRLINES WILL CONTINUE TO ADD NEW AND FASTER AIRCRAFT TO INSURE IMPROVED SERVICE FOR THEIR CUSTOMERS.

Manufacturer	Model	1939	1949	1952	1956	(Jan.)[1] 1959	New aircraft on order for delivery in: 1959	1960	1961
Boeing:	247D, 307B, 314	45	5	----	----	----	----	----	----
	377	----	35	44	34	32	----	----	----
	B707 (Jet)	----	----	----	----	9	36	10	----
	B707-Intercontinental (Jet)	----	----	----	----	----	12	23	----
	B720 (Jet)	----	----	----	----	----	----	26	10
Convair:	240	----	112	113	100	76	----	----	----
	340	----	----	8	123	113	----	----	----
	440	----	----	----	19	31	----	----	----
	600 (Jet)	----	----	----	----	----	----	----	25[2]
	880 (Jet)	----	----	----	----	----	2	38	10
Curtiss:	C-46	----	2	75	94	87	----	----	----
Douglas:	DC-2	56	----	----	----	----	----	----	----
	DC-3	147	449	419	356	331	----	----	----
	DC-4	----	230	185	143	95	----	----	----
	DC-6	----	109	195	299	364	----	----	----
	DC-7	----	----	----	132	252	----	----	----
	DC-8 (Jet)	----	----	----	----	----	19	67	15
Fairchild:	F-27 (Turboprop)	----	----	----	----	21	18	----	----
Lockheed:	L-10	41	6	----	----	----	----	----	----
	Lodestar	----	11	11	10	7	----	----	----
	Other early models	6	----	----	----	----	----	----	----
	Constellation	----	79	115	117	112	----	----	----
	Super Constellation	----	----	24	79	140	----	----	----
	Electra (Turboprop)	----	----	----	----	11	89	26	----
Martin:	202	----	24	21	23	26	----	----	----
	404	----	----	96	97	95	----	----	----
Sikorsky:	All types	28	----	----	----	----	----	----	----
Vickers:	V-700 (Series) (Turboprop)	----	----	----	54	70	----	----	----
	V-800 (Series) (Turboprop)	----	----	----	----	12	3	----	----
Other		24	10	17	25	18	----	----	----
Total Fixed Wing		347	1,072	1,323	1,705	1,902	179	190	60
Helicopters:									
Bell:	B47	----	6	6	7	4	----	----	----
Sikorsky:	S51	----	5	3	2	2	----	----	----
	S55	----	----	5	8	6	----	----	----
	S58	----	----	----	3	5	----	----	----
	V44B	----	----	----	----	5	----	----	----
Total Helicopters		----	11	14	20	22	----	----	----

[1] Piston powered aircraft data are as of January 14 and turbine as of January 31, 1959.
[2] Ten scheduled for delivery in 1961 and 15 in 1962.

COMPARATIVE TRANSPORT SAFETY RECORD

Passenger Fatality Rate per 100,000,000 Passenger Miles
(For Selected Years)

	1939	1949	1951	1952	1953	1954	1955	1956	1957	1958
Domestic Scheduled Airlines										
Fatalities	9	93	142	46	86	16	156	143	30	113
Rate	1.20	1.39	1.35	.37	.59	.10	.79	.64	.12	.45
International and Overseas Scheduled Airlines [1]										
Fatalities	10	4	43	94	2	0	2	9	40	11
Rate	12.80	.19	1.59	2.98	.06	.....	.04	.17	.67	.18
Motor Buses										
Fatalities	[2]	120	130	100	70	60	100	80	70	n.a.
Rate	[2]	.19	.22	.16	.13	.11	.19	.16	.13	n.a.
Railroad Passenger Trains										
Fatalities	32	29	150	14	50	23	19	57	17	61 [3]
Rate	.14	.08	.43	.04	.16	.08	.07	.20	.07	.26 [3]
Passenger Autos and Taxis										
Fatalities	16,300	15,300	21,000	22,600	23,500	22,500	24,700	26,100	25,700	n.a.
Rate	3.7	2.0	2.4	2.8	2.9	2.6	2.7	2.7	2.6	n.a.

[1] Alaska data not included in 1939.
[2] Motor Bus statistics included in Passenger Autos and Taxis.
[3] Preliminary.
n.a. Not Available.

COMPARISON OF RAIL AND AIR FARES WITH TRAVEL TIMES

(1949 and 1958)

FARES

	First Class						Coach					
	Rail [a]			Air			Rail			Air		
	1949	1958	% Change	1949	1958	% Change	1949	1958	% Change	1949	1958	% Change
Chicago—New York	$ 39.55	$ 74.35 [b]	88.0	$ 44.10	$ 47.95	8.7	$22.75	$37.33	64.1	$29.60	$ 34.10	15.2
Detroit—Boston	32.54	51.21 [b]	57.4	38.70	42.30	9.3	19.88	31.03	56.1	.....	32.35	.....
Los Angeles—New York	132.90	163.50	23.0	157.85	166.25	5.3	71.42	92.91	30.1	.....	104.00	.....
Washington—New Orleans	49.73	61.59	23.8	62.95	67.55	7.3	28.32	34.49	21.8	45.70	45.00	—1.5
Dallas—San Francisco	79.56	91.06	14.5	96.35	102.85	6.7	42.88	50.65	18.1	.....	70.70	.....
Minneapolis—Seattle	76.56	87.84	14.7	97.25	103.20	6.1	43.45	47.90	10.2	.....	75.75	.....
Cincinnati—Miami	51.66	64.95	25.7	62.50	68.10	9.0	29.29	36.46	24.5	.....	42.95	.....
Philadelphia—Atlanta	35.19	47.83	35.9	44.25	48.10	8.7	20.00	24.92	24.6	.....	30.35	.....

TRAVEL TIMES

	Rail			Air		
	1949	1958	% Change	1949	1958	% Change
Chicago—New York	15:30	15:30	0.0	2:55	2:25	—17.1
Detroit—Boston	14:50	13:35	—8.4	3:10	2:35	—18.6
Los Angeles—New York	66:00	63:50	—3.3	9:45	7:20	—24.8
Washington—New Orleans	27:00	25:20	—6.2	3:15	3:05	— 5.2
Dallas—San Francisco	47:10	44:15	—5.9	5:20	4:45	—10.9
Minneapolis—Seattle	37:15	36:10	—2.9	7:25	5:20	—28.2
Cincinnati—Miami	33:05	31:45	—4.0	6:18	3:12	—49.2
Philadelphia—Atlanta	15:47	15:08	—4.1	5:26	2:58	—45.3

[a] Includes price of a lower berth.
[b] Roomettes sustituted for lower berth, when no berth charge is shown on timetable.

CLASSES OF UNITED STATES COMMERCIAL AIR CARRIERS

At the end of 1958 there were seven recognized classes of air carriers in the air transport industry of the United States. These classifications are used by the Civil Aeronautics Board in connection with the economic regulation of the industry and under the Civil Aeronautics Act are based largely on the scope of operations authorized or allowed by that Act. Classes One to Six have certificates of convenience and necessity and conduct regularly scheduled services.

1. The Domestic Trunk Lines include those carriers which presently have permanent operating rights within the continental United States. There are currently twelve trunk lines, most of which operate high-density traffic routes between the principal traffic centers of the United States.

American	Continental	National	Trans World
Braniff	Delta	Northeast	United
Capital	Eastern	Northwest	Western

2. The Domestic Local Service Lines have, with one exception, been certificated since 1945. These carriers operate routes of lesser traffic density between the smaller traffic centers and between these centers and principal centers. The thirteen local service lines in 1958 were:

Allegheny	Lake Central	Ozark	Southern
Bonanza	Mohawk	Pacific	Trans Texas
Central	North Central	Piedmont	West Coast
Frontier			

3. The International and Overseas Lines include all U. S. flag air carriers operating between the United States and foreign countries other than Canada. Some of these carriers conduct operations between foreign countries and some are extensions of domestic trunk lines into Mexico and the Caribbean.

Alaska	Eastern	Pan American	Trans Caribbean [2]
American	Mackey [2]	Pan American-Grace	Trans World
Braniff	National	Resort [1 2]	U. M. C. A. [2]
Caribbean Atlantic	Northwest	Samoan [2 3]	United
Delta	Pacific Northern	South Pacific [2 3]	Western

4. The Territorial Lines include two groups of carriers. The Insular Lines operate in the Hawaiian Islands and the Alaskan Lines operate between the U. S. and Alaska and within Alaska.

INSULAR LINES	ALASKAN LINES			
	Operating between the U. S. and Alaska		Operators within Alaska	
Hawaiian	Alaska [4]	Pacific Northern [4]	Alaska	Howard J. Mays [2]
Aloha	Northwest [5]	Pan American [5]	Alaska Coastal	Northern Consolidated
			Bristol Bay [2 3]	Pacific Northern
			Cordova	Pan American
			Ellis	Reeve Aleutian
				Wien

5. The Helicopter Airmail Lines presently operate between airports, central post offices, and suburbs of New York, Chicago and Los Angeles. Originally certificated as exclusive mail carriers they now fly passengers, air freight and air express.

Chicago Helicopter Airways	Los Angeles Airways	New York Airways

6. The All-Cargo Lines operate under temporary certificates authorizing scheduled cargo flights between designated areas in the U. S., and in one case to the Caribbean and in another to Europe.

AAXICO	Flying Tigers	Seaboard & Western
Aerovias Sud Americana	Riddle	Slick

7. Non-Certificated Air Carriers include a diversified group of operators who, with the exception of the air taxi operators and air freight forwarders, are not authorized to engage in regularly scheduled service. They are described in the CAB 1954 Annual Report as follows:

Operators of various types of air services have been authorized by the Board through the exemption process, rather than through the requirement that a certificate of convenience and necessity be obtained. As of December 31, 1958 this group includes:

Supplemental and irregular transport carriers	43
Air freight forwarders	71
Air taxi operators	2019

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[1] Certificated cruise carrier.
[2] Certificated non-mail carriers.
[1 2 3] Statistical data of these carriers are not included in the statistical tables.
[3] Not operating.
[4] Statistical data of these carriers are included with Alaskan Airlines.
[5] Statistical data of these carriers are included with International and Overseas Airlines.

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20TH EDITION
Facts and Figures, 1959

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Bonanza Air Lines, *Edmund Converse, Pres., McCarran Field, P. O. Box 391, Las Vegas, Nevada*
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Central Airlines, *Keith Kable, Pres., Meacham Field, Fort Worth 7, Texas*
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Continental Air Lines, *Robert F. Six, Pres., P. O. Box 9063, Denver 16, Colorado*
Cordova Airlines, *Merle K. Smith, President & Gen. Mgr., P. O. Box 6203, Anchorage, Alaska*
Delta Air Lines, *C. E. Woolman, Pres. & Gen. Mgr., Atlanta Airport, Atlanta, Georgia*
Eastern Air Lines, *E. V. Rickenbacker, Chairman of the Board & Gen. Mgr., 10 Rockefeller Plaza, New York 20, New York*
Ellis Air Lines, *R. E. Ellis, Pres., P. O. Box 1059, Ketchikan, Alaska*
The Flying Tiger Line, *Robert W. Prescott, Pres., Lockheed Air Terminal, Burbank, California*
Frontier Airlines, *L. B. Maytag, Pres., Stapleton Airfield, Denver 7, Colorado*
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Lake Central Airlines, *Gwin Hicks, Pres., Weir Cook Municipal Airport, Indianapolis 44, Indiana*
Los Angeles Airways, *C. M. Belinn, Pres., Box 45155, Airport Sta., Los Angeles 45, California*
Mackey Airlines, *Joseph C. Mackey, Pres., Broward County Int'l Airport, Ft. Lauderdale, Florida*
Mohawk Airlines, *Robert E. Peach, Pres., Oneida County Airport, Utica, New York*
National Airlines, *G. T. Baker, Pres., P. O. Box NAL, Int'l Airport Branch, Miami 48, Florida*
New York Airways, *Robert L. Cummings, Jr., Pres., P. O. Box 426, LaGuardia Airport Station, Flushing 71, New York*
North Central Airlines, *Hal N. Carr, Pres., 6201 34th Ave., South, Minneapolis 50, Minnesota*
Northeast Airlines, *James W. Austin, Pres., 1700 K Street, N.W., Washington 6, D. C.*
Northern Consolidated Airlines, *Raymond I. Petersen, Pres. & Gen. Mgr., 414 Fourth Avenue, Anchorage, Alaska*
Northwest Airlines, *D. W. Nyrop, Pres., 1885 University Avenue, St. Paul 1, Minnesota*
Ozark Air Lines, *Laddie H. D. Hamilton, Pres., Box 6007, Lambert Field, St. Louis 21, Missouri*
Pacific Air Lines, *John H. Connelly, Pres., San Francisco International Airport, San Francisco, California*
Pacific Northern Airlines, *A. G. Woodley, President, 1626 Exchange Building, Seattle 4, Washington*
Pan American-Grace Airways, *Andrew B. Shea, Pres., 135 E. 42nd Street, New York 17, New York*
Pan American World Airways, *J. T. Trippe, Pres., 135 E. 42nd Street, New York 17, New York*
Piedmont Airlines, *T. H. Davis, President, Smith Reynolds Airport, Winston-Salem 1, N. C.*
Reeve Aleutian Airways, *Robert C. Reeve, Pres. & Supt. Operations, Box 559, Anchorage, Alaska*
Resort Airlines, *T. B. Wilson, Chair. of the Bd. & Chief Exec. Off., Suite 326, 1346 Connecticut Ave., N.W., Washington 6, D. C.*
Riddle Airlines, *George L. Giles, President, P. O. Box 535, Miami International Airport Branch, Miami 48, Florida*
Seaboard & Western Airlines, *Raymond A. Norden, Pres., 80 Broad Street, New York 4, New York*
Southern Airways, *Frank W. Hulse, Pres., 1140 Brown-Marx Building, Birmingham, Alabama*
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Trans Caribbean Airways, *O. Roy Chalk, Pres., 160 Central Park South, New York 19, New York*
Trans Texas Airways, *R. E. McKaughan, Pres., Suite 814, First City National Bank, Houston 2, Texas*
Trans World Airlines, *Warren Lee Pierson, Chairman of the Board, 1000 16th Street, N.W., Washington 6, D. C.*
United Air Lines, *W. A. Patterson, Pres., 5959 S. Cicero Avenue, Chicago 38, Illinois*
West Coast Airlines, *Nick Bez, Pres., Boeing Field, Seattle 8, Washington*
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Industry Meets Jet Financing Needs

Planes are being paid for as delivered, future funds or credits have been arranged

By SELIG ALTSCHUL
Contributing Editor

The transition to jet transportation is an accomplished fact. New turbine equipment has now been introduced into regular schedule patterns by five major airlines. As 1959 moves along, other carriers will follow in rapid order in bringing jet transportation to a receptive traveling public.

Acceptance of jet travel has been most heartening and is a major factor which may facilitate the industry's abilities to generate sufficient revenues to be converted into adequate cash throw-offs and residual earnings to pay for the huge capital expenditure program ahead.

Capital expenditures will most likely exceed $3 billion by the time currently projected programs are completed around 1962. This compares with a net worth of $736 million at June 30, 1958 for all U.S. certificated airlines, (domestic and international). Total assets of the same group amounted to $1,748 million as of the same date.

Despite this apparent disparity between capital commitments and existing resources, payment is being made for new aircraft as delivered. And more importantly, virtually all of the U.S. carriers have arranged to obtain the necessary funds and/or credits to pay for the equipment remaining on firm order and to be delivered. As of December 31, 1958, all U.S. airlines had on order over $1.6 billion in aircraft and aircraft engines.

It is now pretty well established that the industry's existing capital requirements, for the most part, are being satisfactorily anticipated amidst apprehensions created by academic studies premised on projections which were nothing more than a "numbers" game and devoid of the financial facts of life.

The search for funds continues unabated and is continuously being influenced by varying factors. And even planned capital commitments are not inviolate and are subject to revision. For example, with little fanfare, commitments for new jets have been cut back by National, Delta and Eastern.

Aside from alleviating some pressure on capital requirements through various leasing and interchange arrangements, the bulk of funds must come from established conventional sources.

Funds for capital expenditures are generally derived from the following sources:

1. Internal self-generation of cash such as from depreciation and amortization charges.
2. Sale of surplus equipment.
3. Retained net profits.
4. Additional capital to be raised through equity and/or debt financing.

The internal self-generation of cash figures most importantly in the financial capability of the airlines to meet their commitments. For perspective, it is noteworthy that the domestic trunk airlines while reporting $58 million in aggregate net profits for 1956, threw off more than $100 million in cash through depreciation charges that year. In 1957, with net earnings including net capital gains of but $28 million, depreciation and amortization charges came to around $148 million. For 1958, with aggregate industry earnings and net capital gains around $44 million, depreciation and amortization charges, despite downward adjustments in the basis used, amounted to almost $157 million. Accordingly, during the past three years more than $405 million was generated from this internal source as compared with $130 million from net earnings.

The internal self-generation of cash projected for current and future periods is sometimes subject to wide variations. As is known, the CAB previously ruled that, as of January 1, 1957, the carriers were to capitalize various spare parts accounts and include them among current assets. This represented some $50 million of equipment which, as a result of a federal court decision reversing the Board, was subject to be returned from current assets to property accounts where they can be depreciated. Even more significantly was the industry's successful challenge (as a result of the ruling in the spare parts question) to the CAB's order to depreciate new four-engine piston aircraft on a seven year basis, capitalize one-half the cost of the first overhaul and raise the residual value to 15% from 10%. During most of 1958, the industry followed the

—SIGNIFICANT CASH GENERATION—U.S. TRUNK AIRLINES—
(In Millions)

	1958		1957	
	Depreciation-Amortization	Net Earnings	Depreciation-Amortization	Net Earnings
American	$ 22.9	$ 16.1	$ 21.8	$ 10.9
Braniff	6.6	3.0	6.2	1.7
Capital	10.2	.21	10.1	(3.2)
Continental	3.2	(.13)	1.9	0.1
Delta	9.5	3.3	7.7	2.1
Eastern	20.3	7.1	29.3	9.4
National	8.1	(.5)	6.9	1.1
Northeast	2.9	(3.7)	1.5	(4.3)
Northwest	8.5	5.6	5.4	4.8
TWA	31.6	(1.8)	26.7	(1.6)
United	28.9	13.8	27.3	4.9
Western	4.1	1.4	3.0	2.4
Total	$156.8	$ 44.4	$147.8	$ 28.3

( ) = Deficit

Source: Company reports.

edict on depreciation policy as stipulated by the Board. Late in the year, reversals were made by many of the carriers as to the more conservative depreciation policies as outlined by the Board. However, reversals by management were not complete in all respects. For example, the 15% residual value was retained and reversals as to the useful life periods were not, in all instances, restored to the former basis. As a result of the changes in depreciation applied in 1958 as compared with 1957, net earnings after taxes were higher for American by $1,650,000; Eastern by $10,850,000, and United about $1,500,000. These are a few of the examples. Reported net earnings of the other carriers were also bolstered by changes in depreciation policies pursued.

Still another source of cash generation from internal sources is present through deferred federal income taxes as a consequence of accelerated amortization certificates on equipment. While taxes are deferred to a later date, the immediate effect is to generate considerable cash and assist importantly in capital formation. For 1958, cash generated from this source amounted to $9,627,000 for American, $2,883,000 for Eastern and $4,832,000 for United.

Capital formation set in motion many years ago figures prominently in the successful financing recently accomplished by a number of air carriers.

An outstanding example is provided by American Airlines. This carriers' jet equipment acquisition program for 110 airplanes entails a total capital expenditure of about $365 million. The company will be able to pay for these purchases partly with the $135 million in long-term debt financing arranged with insurance companies a few years ago plus $70 million in additional debt to be placed privately soon. Existing cash resources, proceeds from sale of surplus aircraft and retained net earnings are expected to make up the balance of funds now required.

It is an astounding fact that this program was able to move forward without any benefit of additional equity type financing (of any appreciable amount) since 1946, until the present when $40 million of 5% subordinated convertible debentures were placed as part of the $70 million in new debt.

But it was the public financing in 1946 when American obtained some $80 million in new funds through debenture and convertible preferred stock flotations at the lowest terms ever obtained which made it relatively easy for the company to place its recent long-term debt with insurance companies. It had established a strong equity base upon which to build future growth.

It was this $80 million, sold by underwriters, which gave American the funds to embark on a number of cycles of re-equipment programs, including the DC-4's, the DC-6's and the DC-7's. For the twelve year period from 1947 through 1958, inclusive, American generated almost $200 million in cumulative depreciation and amortization charges on its equipment. This proved to be a potent source of funds for progressive equipment programs.

Another major variable influencing financial requirements is present in the proceeds to be realized from the sale of used aircraft. This is an area of great imponderables. For the most part, a solid indication of the funds to be obtained from this source will not be known until the equipment is actually disposed of. And in a number of cases, deliveries and payments will have time delays thus denying a carrier the benefits of these funds until a later date. This can be upsetting as the immediacy of cash exerts an important influence on financing schedules.

Retained net earnings will, of course, be importantly affected by the ultimate accounting treatment on depreciation and spare parts. Residual net earnings remaining in surplus may further be reduced by cash dividends paid. Airlines are mindful of the need to attract equity funds and a consistent dividend policy is known to frequently improve the investor appraisal of a company. Nevertheless, cash dividends represent an immediate disbursement of funds and must be replaced through other sources.

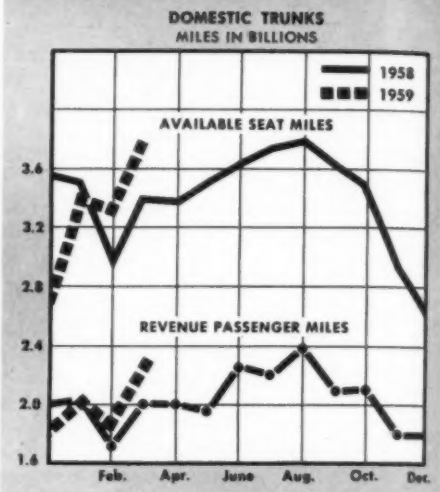
Most of the major U.S. airlines have established credit agreements which will help materially in financing their capital equipment programs ahead.

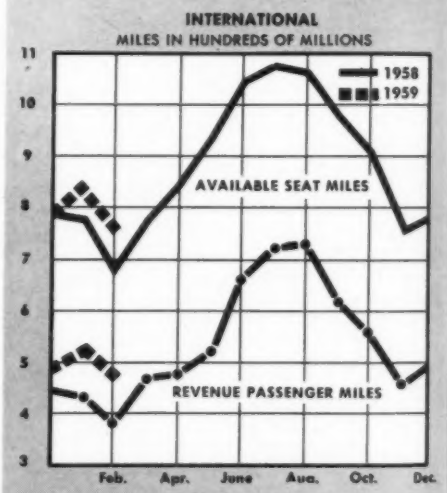
What is not fully appreciated in many quarters is the fact that existing loans and credits yet to be drawn down are subject to the maintenance of certain debt/equity ratios and asset or working capital requirements. To the extent that earnings and proceeds from surplus aircraft sales fall short of providing the necessary funds, additional equity will be required from the capital markets.

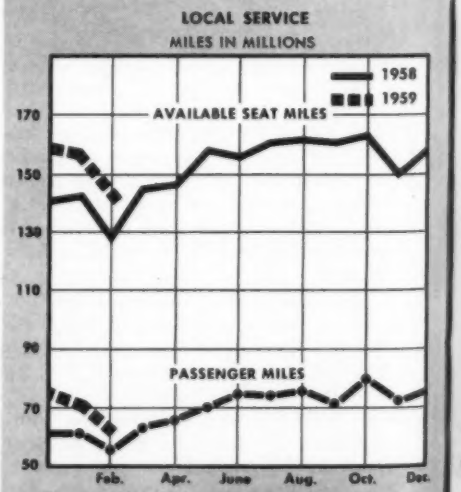
Many carriers are now very thin in their equity positions to support the measure of capital commitments undertaken.

The keystone to the program of the trunks going forward with their capital expansion programs rests on increasing earning power to be made available by the most advanced equipment attainable. This has facilitated equity or equity-type financing which in turn made possible broadening credit lines.

HOW'S TRAFFIC







U.S. Airline Traffic for February 1959 vs. February 1958

This complete summary compiled by AIRLIFT magazine from Official CAB Records.

	Revenue Passengers (000)			Revenue Passenger Miles (000)			Total Ton-Miles Rev. Traffic			% Available Ton-Miles Used	
	1959	1958	% Change	1959	1958	% Change	1959	1958	% Change	1959	1958
DOMESTIC											
American	513	507	1.2	353,662	326,262	8.4	43,529,393	39,748,197	9.5	56.4	52.0
Braniff	165	160	3.1	69,850	67,685	3.2	7,674,802	7,304,291	5.1	50.3	45.3
Capital	268	271	—1.1	116,364	104,587	11.3	12,069,632	10,934,750	10.4	46.3	44.0
Continental	60	56	7.1	28,729	24,784	15.9	3,034,499	2,630,516	15.4	42.6	42.1
Delta	221	209	5.7	114,072	106,409	7.2	12,677,213	11,741,705	8.0	51.6	48.2
Eastern	587	580	1.2	344,678	338,702	1.8	35,721,912	34,896,984	2.4	49.5	48.3
National	153	124	23.4	106,694	88,021	21.2	11,342,633	9,426,265	20.3	49.5	47.6
Northeast	82	60	36.7	43,762	32,307	35.5	4,443,526	3,326,026	33.6	43.2	40.3
Northwest	117	96	21.9	88,453	59,367	49.0	10,319,761	6,977,359	47.9	42.5	42.8
Trans World	331	308	7.5	266,897	233,712	14.2	29,426,828	25,529,473	15.2	54.6	50.7
United	479	445	7.6	327,539	296,687	10.4	40,179,176	35,670,070	12.6	53.7	52.8
Western	108	78	38.5	56,954	39,989	4.4	6,052,990	4,273,159	41.6	49.2	48.6
TOTALS	**3,084**	**2,894**	**6.6**	**1,917,654**	**1,718,512**	**11.6**	**216,472,365**	**192,458,795**	**12.5**	**51.4**	**49.2**
TERRITORIAL											
Caribair	29	24	20.8	2,062	1,653	24.7	225,387	179,426	25.6	77.8	68.1
Hawaiian	29	23	26.1	4,368	3,504	24.7	454,758	385,596	17.9	58.8	54.5
Trans Pacific	13	10	30.0	1,717	1,370	25.3	143,642	118,588	21.1	54.9	55.4
TOTALS	**71**	**57**	**24.6**	**8,147**	**6,527**	**24.8**	**823,787**	**683,610**	**20.5**	**62.2**	**57.6**
LOCAL SERVICE											
Allegheny	31	25	24.0	5,257	4,238	24.0	548,621	436,479	25.7	42.2	38.6
Bonanza	16	15	6.7	3,743	3,488	7.3	372,963	345,517	7.9	50.1	46.5
Central	11	9	22.2	2,258	1,725	30.9	236,359	176,888	33.6	32.7	28.3
Frontier	18	17	5.9	4,281	4,589	6.7	485,493	510,587	4.9	50.3	59.1
Lake Central	14	13	7.7	2,217	2,044	8.5	227,530	208,040	9.4	42.6	37.7
Mohawk	36	27	33.3	6,768	4,803	40.9	676,256	487,840	38.6	54.7	46.2
North Central	54	51	5.9	8,785	8,200	7.1	900,538	832,275	8.2	46.3	43.7
Ozark	31	31	...	5,449	5,041	8.1	559,295	515,113	8.6	49.0	45.0
Pacific	29	26	11.5	6,467	5,890	9.8	639,742	589,035	8.6	47.0	50.0
Piedmont	30	25	20.0	6,251	5,063	23.5	633,031	510,327	24.0	40.6	42.3
Southern	16	15	6.6	2,901	2,744	5.7	305,303	282,700	8.0	35.4	34.7
Trans-Texas	18	17	5.8	4,118	3,794	8.5	438,369	408,099	7.4	41.9	37.5
West Coast	22	18	22.2	4,327	3,249	33.2	427,830	321,881	32.9	45.3	42.9
TOTALS	**326**	**289**	**12.8**	**62,822**	**54,868**	**14.5**	**6,451,330**	**5,624,781**	**14.7**	**45.0**	**43.0**
HELICOPTER											
Chicago	8	6	33.3	152	110	38.1	15,509	12,254	26.6	30.6	27.9
Los Angeles	2	2	...	85	65	30.8	14,139	11,007	28.5	54.6	54.1
New York	6	4	50.0	124	81	53.1	14,972	10,079	48.5	39.3	38.0
TOTALS	**16**	**12**	**33.3**	**361**	**256**	**41.0**	**44,620**	**33,340**	**33.8**	**38.9**	**37.1**
INTERNATIONAL											
American	11	11	...	12,598	11,036	14.2	1,554,174	1,462,114	6.3	73.0	69.8
Braniff	3	4	—25.0	6,455	7,941	18.7	819,653	969,406	15.4	44.2	49.6
Delta	4	6	—33.3	4,151	5,984	—30.6	512,593	712,604	—28.1	40.1	50.6
Eastern, Overseas	30	26	15.4	44,606	36,068	23.7	4,853,840	3,926,023	23.6	62.8	56.8
San Juan	24	20	20.0	35,252	28,111	25.4	3,810,409	3,036,508	25.5	63.1	57.9
Bermuda	1	2	—50.8	1,010	1,370	—26.3	109,161	145,417	—24.9	29.4	33.3
Mexico	5	4	25.0	8,344	6,587	26.7	934,270	744,098	25.6	70.7	62.6
National	6	12	—50.0	4,559	7,618	—40.2	529,157	884,976	—40.2	46.6	48.3
Northwest	9	7	28.6	20,296	16,425	23.6	4,359,861	3,328,436	31.0	63.7	57.0
Hawaiian	2	2	...	6,213	4,052	53.3	684,969	449,279	52.5	70.6	64.4
Panagra	11	10	10.0	15,228	14,159	7.5	2,153,857	2,037,363	5.7	67.1	63.6
Pan American, System	186	172	8.1	274,186	231,473	18.5	39,636,942	33,449,762	18.5	63.9	58.0
Latin America	101	94	7.4	102,083	93,456	9.2	14,923,135	13,334,679	11.9	69.7	65.3
Atlantic	61	58	5.2	85,059	73,070	16.4	12,531,193	10,910,825	14.8	56.0	50.8
Pacific	22	18	22.2	85,059	62,414	36.3	11,836,725	8,763,127	35.1	68.4	61.3
PDX/Sea-Hon.	...	1	...	.....	4,272	....	.....	477,135	....	....	52.5
Alaska	2	2	...	1,985	2,533	—21.6	345,889	441,131	—21.6	37.6	46.8
Trans Caribbean	6	...	...	10,258	.....	....	951,142	.....	....	66.2	....
Trans World	22	14	57.1	65,416	38,178	71.3	9,430,139	5,351,374	76.2	67.7	53.5
United	7	6	16.7	16,728	15,110	10.7	1,921,631	1,701,900	12.9	57.0	52.0
Western	4	2	100.0	6,308	2,477	54.7	689,388	272,893	152.6	66.1	69.8
TOTALS	**299**	**270**	**10.7**	**480,789**	**386,469**	**24.4**	**67,412,377**	**54,096,851**	**24.6**	**63.6**	**57.9**
ALASKAN											
Alaska	5	5	...	2,708	1,958	38.3	485,999	380,450	27.7	36.3	36.5
Alaska Coastal	3	3	...	242	215	12.6	31,518	28,577	10.3	64.9	64.2
Cordova	1	1	...	96	123	—21.9	44,354	19,674	125.4	43.5	34.6
Ellis	3	2	50.0	185	139	33.1	22,309	17,362	28.5	67.5	65.2
Nor. Consolidated	1	1	...	400	346	15.6	97,263	98,745	—1.5	62.6	60.4
Pacific Northern	6	6	...	5,434	4,581	18.6	866,963	748,139	15.9	48.5	43.7
Reeve	1	1	...	617	629	—1.9	181,436	162,061	11.9	53.8	43.7
Wien	2	1	100.0	540	342	57.9	334,324	182,362	83.3	58.1	67.5
TOTALS	**22**	**20**	**10.0**	**10,222**	**8,333**	**22.7**	**2,064,166**	**1,637,370**	**26.1**	**47.1**	**44.4**

RECORD RATE OF INCREASE

SE OF PROTEUS OVERHAUL LIFE

PROTEUS 705 SERIES ACHIEVES

2,000 HOURS

IN UNDER TWO YEARS' SERVICE

Bristol Siddeley Proteus first entered airline service two years ago. Overhaul life on the 705 series has now reached 2,000 hours—a rate of increase never before achieved by any other engine, piston or gas turbine

No engine of comparable power in service today has an overhaul life that even approaches this length. Annual engine overhaul costs for BOAC's Britannia 102 aircraft have now been cut by 75% since the aircraft went into service.

Continued development, even lower fuel consumption. Further increases will give Proteus even longer overhaul life, entailing even lower operating costs. In addition, new versions of this engine—which already has a lower specific fuel consumption than any other gas turbine in civil or military use—are now giving even more power at an even lower specific fuel consumption.

Over 2½ million miles a month in world service Every day, all over the world, Proteus-powered Britannias fly more than 80,000 miles (2½ million miles a month), carrying passengers in quiet, speedy luxury, carrying a great variety of freight loads, and bringing profit to operators.

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What's New About Turbofans

Design details of two radically-different approaches by GE and P&W to "economy" jets.

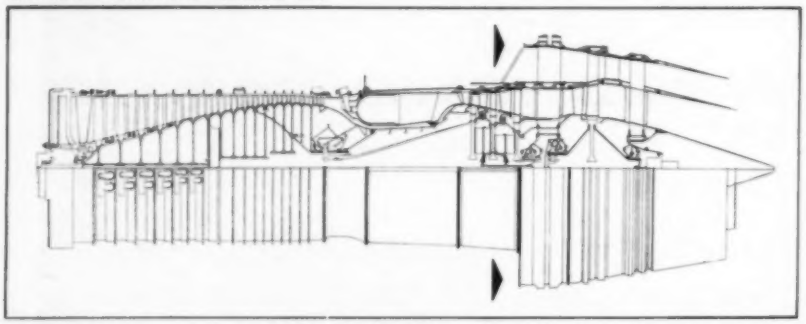
By BILL COMBS

The kingpins of the jet engine industry, General Electric and Pratt & Whitney, are stepping up competition to sell what they believe is the most significant powerplant development in years—the turbofan engine.

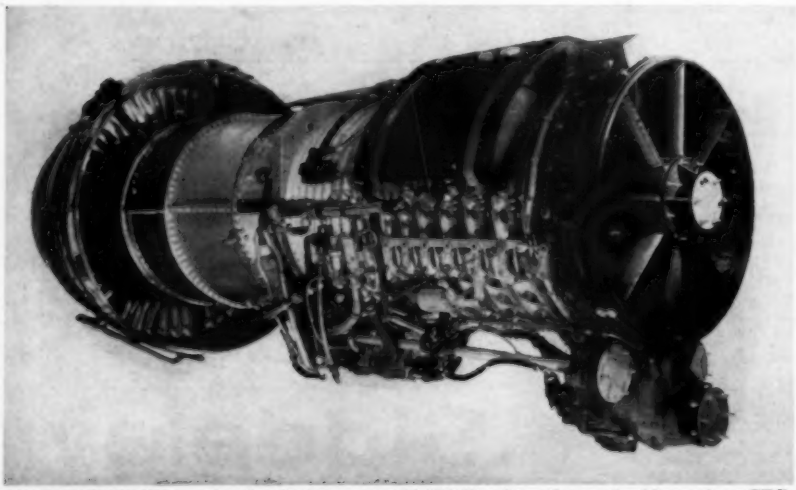
It's a seller's market, for airline engineers agree with the manufacturers that the turbofan resolves many of the straight jet's shortcomings and may become as common as supercharging has to piston engines. The turbofan has produced gains in thrust, fuel economy, engine specific weight, and made big reductions in noise level, all without incurring any of the performance penalties which normally accompany new developments.

A big selling point of the GE and Pratt & Whitney turbofan approach is the fact that both engines are adaptations of proven straight jet designs, and both companies are offering kits to convert from turbojet to fan.

General Electric CJ805-21



Cutaway shows conversion of CJ805-3 to turbofan by adding fan and ducting at rear. New parts are shown by broken line segments.



Thrust, 15,000 lbs. sea-level std. (approx.), 16,400 lbs. for advanced –23 version; SFC, 0.5 (approx.); dry weight, 3,800 lbs.; specific weight, 0.253 (approx.); by-pass ratio, 1.56 sea-level; total mass flow 422 lbs./sec. (approx.) Engine based on CJ805-3 variable-stator turbojet.

General Electric's gas generator is the variable-stator CJ805-3, while Pratt & Whitney is using its JT3C-6 twin-spool.

Though the same in principle, the manufacturers' turbofan applications are 180 degrees apart—GE putting the fan in the rear, and Pratt & Whitney placing its fan in the front of the engine.

At General Electric

Essentially, GE's aft fan consists of a single stage added to the rearmost section of the -3 engine. The fan is driven by the gas generator exhaust flow, with no mechanical interconnection.

In converting from the -3 to the turbofan, GE replaced the -3 turbine aft frame with the fan front frame, increased the capacity of the lubricating system, and added an override valve to the fuel control to cut off fuel flow in case of fan overspeed.

Key component of the GE fan is the rotor blade—dubbed a "blucket". The blucket acts as part turbine—that portion in the main engine exhaust stream—and part compressor—the half extending in the by-pass region. The blucket consists of a dovetail arrangement with a transition section between the turbine and compressor parts of the blade.

The front and rear faces of the transition section form teeth which serve as axial seals to maintain separation of the turbine and fan flow streams.

To simplify maintenance of the engine, GE has designed the frame assemblies so they can be removed and replaced in either vertical or horizontal position. The aft fan can be treated as a package, or can be installed by component sub-assemblies.

Front and rear frames are of sheet metal construction. The front frame contains the outboard turbine roller bearing support for the gas generator and the thrust bearing for the fan rotor. Eight struts, which pass through the compressor and exhaust ducts, continuously pass anti-ice air, obtained by

bleeding 0.2% of the gas generator exhaust.

To date, GE has built seven aft fan engines. One has completed two 150 hr. type tests, another has done noise level tests, and a third is undergoing thrust reverser tests.

The reverser for the turbofan is designed to give 35% thrust. The unit fastens to integral attachments on the fan aft frame.

GE is presently conducting a 1,000 hr. airline test in which typical flights are simulated by applying taxi, takeoff, climb, cruise, and reverse thrust power over one to two hr. periods.

These runs, held at the GE Evendale, O. plant, have shown the engine to have an acceleration time under six seconds from idle to full power. In simulating go-around throttle bursts, full power is achieved in two to three seconds. GE says brush tracings of acceleration tests have shown no tendency toward rpm overshoot, excessive temperatures, or compressor surging.

Flight tests of the aft fan are scheduled to begin early next year. About the same time, engines will be turned over to Convair for flight tests in the Model 600. Full-scale production of the engines will begin in early 1961.

Only aft fan customer so far is American Airlines, which will lease 25 engines for use on its CV 600s. Lease cost is set at $196,000 per unit, or $50,000 to convert to fan from the basic -3.

At Pratt & Whitney

Pratt & Whitney, in developing blades for its front fan design, borrowed heavily on experience gained in the J91 nuclear turbojet program. The blades are about 16 in. long, with a very narrow chord.

Short-span shrouds are integrally forged to each blade, about 2/3 the distance from the hub. These shrouds serve the purpose of a conventional turbine tip-shroud. When the fan blades are assembled, the shrouds rest on each other and act to reduce vibration.

Both fan and turbine blades will be offered to customers in either titanium or steel construction.

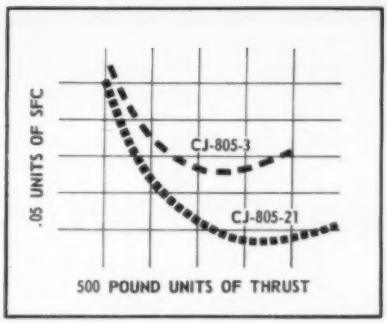
One of the novel features of the Pratt & Whitney turbofan is the short discharge ducts which exhaust the fan air well forward on the engine nacelle. Pratt & Whitney adopted this design to cut pressure losses incurred with full-length ducts, and aid in discharging debris which might result from damage to the fan system.

Pratt & Whitney says the pressure recovery and weight savings of the short ducts more than make up for the rise in skin drag resulting from passing the high-velocity air along the nacelle. Though installation difficulties on particular airplanes may present some problems, Pratt & Whitney plans to wrap the ducts as far as possible around the nacelle.

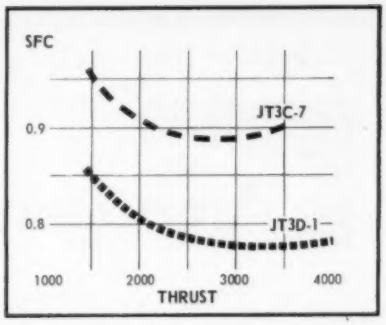
A reverser is being designed which will apply reverse thrust in the plane of the main engine exhaust and the discharge ducts.

Like GE, Pratt & Whitney has built seven engines to date. Two 150 hr. type tests have been completed, and calibration runs for cruising speed and altitude have been made.

Production of the engine will begin in July, 1960, and though no firm orders have yet been received, Pratt & Whitney expects a military sale for B-52 and KC-135 installation in the near future. Also, the company feels it will sell a good number of retrofit kits to commercial operators now using the JT3C.

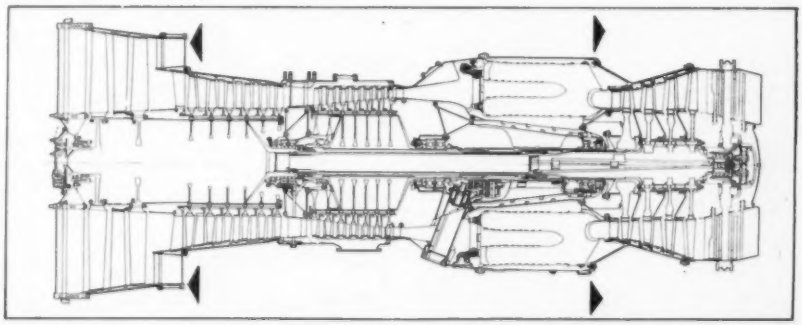


CJ 805-21 aft-fan compared to the –3 at 35,000 ft., Mach 0.8. Actual values are not shown for security seasons, but cruise SFC is approximately 8-12% improved by addition of fan. Turbofan has 35% more takeoff thrust, and is 7-16 db quieter than unsuppressed –3.

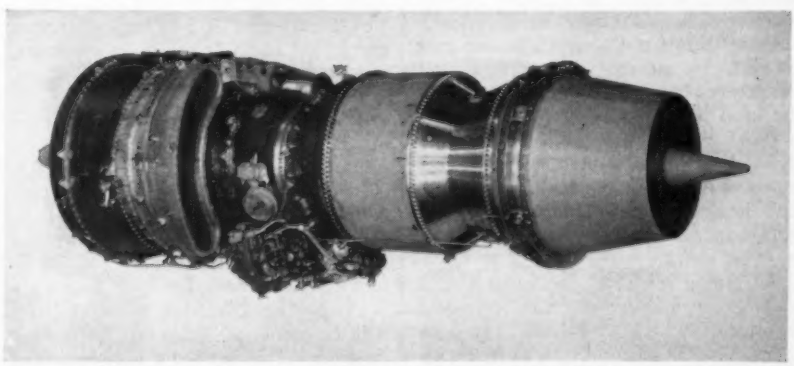


Advantage of JT3D-1 over JT3C-7 is shown in chart for cruise condition at 35,000 ft., and Mach 0.82. Cruise SFC is approximately 13% less. At takeoff, JT3D gives 33% more thrust, and is 10 db quieter than straight-jet counterpart.

Pratt & Whitney JT3D-1



Pratt & Whitney cutaway shows how JT3C was reworked into front turbofan. Turbine added at rear drives the compressor fan at front.



Thrust 17,000 lbs. sea-level std.; SFC, 0.585; dry weight, 4,200 lbs.; specific weight, 0.253 (approx.); by-pass ratio, 1.40 sea-level; total mass flow 432 lb./sec. (approx.) Engine based on JT3C-6 twin-spool turbojet.

SPECIAL REPORT

American's Jet Operations

By FRED S. HUNTER

. . . On the ground

American Airlines' Flight 2 was preparing to takeoff at Los Angeles International Airport for its nonstop flight to Idlewild in New York.

A mechanic crouched under the nose of the airplane strained to pickup the words the pilot was saying as the P&W JT3A engines of the Boeing 707 were being started. Communications between the ground and the cockpit aren't completely satisfactory. AA is working on a fix. The right microphone-headset combination should do it, but it takes trial and error methods.

Soon all four of Flight 2's engines were rumbling. Systems were checked out. The airplane began to roll. This time from a new position on the ramp. Another fix. Previously, a tractor was used to push it out from the gate. Then it taxied under its own power, ready to take off.

By moving the airplane farther out —away from the loading gate and pointed away from the path of other airplanes taxiing into or away from other gate positions—departure could be speeded and less fuel consumed on the ground. But this fix created a new problem.

For quieter operation, AA uses a fixed Hobart 125 KVA generator in preference to a portable unit to provide ground power to the 707 before the plane's engines are started. Moving the airplane out stretched the heavy cabling between the fixed power unit at the gate to the airplane to a full 60 feet, the maximum length that could be used without loss of power.

With Flight 2's engines turning, the ground power was disconnected and a ramp mechanic hustled out to remove the longer length of heavy cable, a job calling for substantial muscle and a strong back.

F. J. Mullins, AA's western regional operations manager, eyed the proceedings critically. "Let's put that cable on a reel; we'll wear out both the mechanic and the cable this way," he said.

These are examples of the kind of fixes AA keeps making as it learns more about jet operations on the line. Most of the changes are in ground services, but some are on the airplane.

AA started out with a 50-50 split between first class and coach seats, 56 each. But it turned out that more people wanted first class than coach. AA shifted the bulkhead between the two sections, cut back on the coach capacity and added three more rows of four-abreast seating to boost the first class total to 68.

This seat story may change this summer when the tourist season booms. If so, the bulkheads and the seats undoubtedly will change again.

AA has had no turbine wheel failures in its JT3A turbojet engines, but Pan American did have one. More than likely it was an isolated case, but it brought about a revision in AA's engine inspection plans. Instead of waiting until 500 hours to check burner cans—the original plan—AA pulled engines at 300 hours for installation of beefed-up turbine wheels. Since no problems have arisen, AA is proceeding to 400 hours on 10 engines. If these turn out OK as anticipated, AA will return to the planned program.

Overhaul time on AA's JT3A engines is set at 800 hours to start. Engines will be removed at Los Angeles, where line maintenance on the 707s is performed, and shipped by truck to the carrier's overhaul base at Tulsa for the work.

AA currently is performing service checks on its 707s at 25 to 35 hours, but is preparing to go to 50 hours. A periodic comes at 250 hours, but this will be extended out to 300 hours after 10 planes. A periodic inspection requires about 550 manhours and AA is scheduling its periodics to be performed within a 12-hour period in order to minimize the time an airplane is out of service. A crew of 70 is required to accomplish this goal.

Progressive overhaul of AA's 707s will be done at Tulsa at 2,400-hour intervals. This is being supplemented by a sampling system embracing the structure of the airplane tied in with the periodic inspections. Some of this sampling will take place at 300 hours, some at 600-hour intervals.

AA is refueling its Boeing 707s with 5,500-gal. trucks and usually two trucks suffice because normally inbound flights arrive with 3,000 gallons or more in their tanks. But the carrier is completing installation of a hydrant system adjacent to its tank farm at its maintenance base at the Los Angeles International Airport. C. F. Turcott, AA's western regional aircraft service director, is looking forward to the day when his crews will take a 707, refuel it, put the food on and service it completely at the hangar before towing it to the loading gate.

This objective, Turcott admits, will take a bit of doing. Establishing exact fuel requirements in advance might not be practical. But, at least, full mains can be handled at the hangar. Putting food on an airplane too far ahead of serving time makes trouble, because keeping it hot keeps cooking it. It takes 45 minutes to an hour for the flight engineer's preflight on a 707, and it takes 20 minutes to tow one from the hangar to the gate. But the more you can do in getting an airplane ready at the hangar, the more gate time you can save and this, Turcott holds, is worth the effort.

AA continues to test out ground equipment. It's normal procedure is to use the bottles on the aircraft for high pressure air for starting. But it uses low pressure air from ground units at the hangar and presently has seven different types of devices under test, including both the AiResearch Manufacturing and Boeing gas turbine units.

. . . In the air

The effects of a "learning curve" on jet air traffic control coupled with some longer-than-expected airport ground times stand out as the two big factors harassing airline jet operations to date.

This, in brief, is the experience of American Airlines with 707s during its first two months of operation.

In some 57 actual schedules analyzed to date, 36% exceeded planned schedule by 10 min. or more; 20%

took 20 min. or more over schedule; 9% ran at least 30 min. overtime; one flight clocked in one hr. 21 min. late.

On the other side of the ledger, 10% of flights arrived 10 min. early.

The reasons: mostly wrinkles in ATC, but some operating problems. Nearly all overtime schedules showed one or more changes in altitude than planned.

On the ground, at least at Idlewild and Los Angeles, the fuel thirsty jets are averaging almost eight minutes longer than the 12-minutes used by piston predecessors to taxi from ramp to takeoff.

For 52 nonstop schedules, American has averaged 19.7 min. At Idlewild the average is 21.1 min., at Los Angeles, 17.7 min.

These were the highlights of a review of AA's 707 operation given by M. G. "Dan" Beard, asst. v.p. equipment research, recently to the Society of Automotive Engineers.

Covering the jet waterfront from schedules to spare parts, he noted these facets of American's operation:

Two attempts on Boeing's IBM computer failed to come up with a four-season plan for schedule times and advance sale payloads. AA had to resort to a "Monte Carlo" method to get first schedules out.

Headwinds 50 knots

AA finds westbound headwinds run 49 to 50 knots; eastbound tailwinds are 50 to 52K.

Winter presale payload was 24,500 lbs. east and west. Starting April 26, AA introduced summer figures of 22,-800 lbs. westbound and 29,000 lbs. eastbound. But AA figures that restricted ATC routings and military block-off of 10,000 ft. of altitude at a clip is forcing more en route altitude changes than expected. Pilots are prone to want greater fuel reserves, are carrying better than 5,000 lbs. more fuel than planned for nonstop schedule.

AA pilots take off by the second hand on a clock. If the time to 100 knots equals or is less than a check chart table, he proceeds. If a few seconds longer, he makes a quick decision to abort or go ahead.

The swept wing jets must be actually flown on the ground, especially laterally, at high ground speeds. This is particularly true in crosswinds as it is possible to scrape the outer pod with a 7 to 8 deg. lateral roll.

AA has given up on "touch and go" landings in 707 training. Reason: the "after touchdown" procedures do not get executed in such operations. American figures 707 crews will average only one landing every five hours and what is not mastered in training will take a long time to learn in operation.

At first, AA's pilots average 20 transition flight hours per man, but 12 to 20 hrs. on training aids has cut this to 15. It expects experience in training on the problem areas will further reduce this to 12 hrs.

American's source of most mechanical problems has shifted from the engine to electrical wiring and electronics. The Pratt & Whitney J57s have given almost no trouble.

In spare parts, the big problem facing AA is that some accessory suppliers stopped production on items as soon as they learned of upcoming changes. It forced the airline to go to Seattle and borrow from production line aircraft, in some cases, necessitated getting a supplier back into production on an item.

A complex flight

Probably the most complex flight situation experienced by AA and described by Beard follows with some paraphrasing for brevity:

Westbound trip planned at 28,000 ft., winds 75K to 90K until west of Colorado River. At departure Idlewild, alternate Palmdale close to limits, rain at Phoenix, Los Angeles closed. LA forecast considerable improvement by time of arrival.

Fuel reserve set at 13,500 lbs. on arrival LA; takeoff water reduced to 400 gals. to add 2,400 lbs. fuel. After reporting Allentown, ATC advised Indianapolis could not take flight at 28,-000. Captain asked for alternative, was given 33,000, but declined account weight.

ATC then offered 16,000, but Captain declined because fuel consumption would force landing at Phoenix. ATC asked which altitude pilot would take. He asked why intermediate altitude wasn't available, was told Air Force had blocked off all intermediate altitudes along that route for in-flight refueling.

ATC asked if flight could hold for 30 min., but pilot declined as this, too, would force landing at Phoenix. Pilot then took 33,000, was ordered to be there before crossing Morgantown, Pa. Required power slightly above max. cruise for about 45 mins. Winds 100K increased to 124K between Amarillo and Albuquerque.

Crew checks of ground speed (without Doppler radar) using regional radar produced consecutive readings varying from 260K to 340K. Captain did not finally determine that he could make LA with required reserve until over Prescott, Ariz. On arrival LA, fuel on board was 15,500 lbs. Error in fuel estimate traced to malfunctioning gauge. Time of flight 7 hrs. 23 min.

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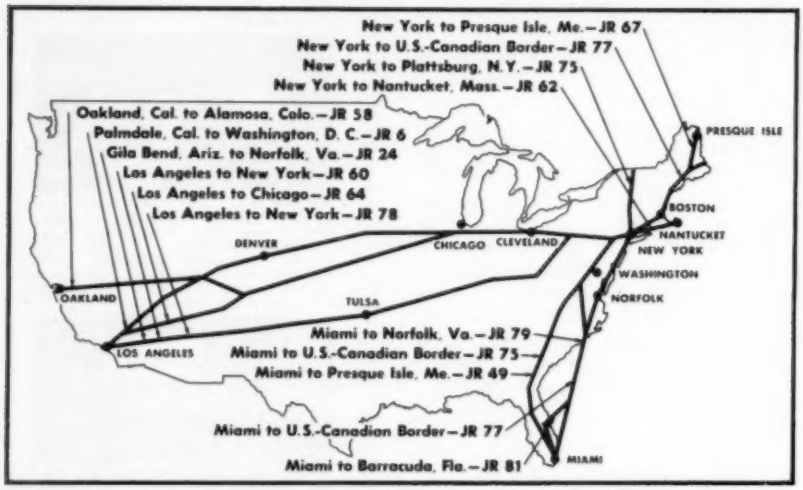

Limited number of routes now available to jets will be short-lived, expansion of service will increase optional routings.

What's ahead for Airways

Federal Aviation Agency's Bureau of Research and Development is alive with projects under five-year airways modernization plan. But Bureau of Air Traffic Management can't wait, must handle jets today. This special AIRLIFT report tells how they are faring.

By JOSEPH S. MURPHY

One day late this month, the first piece of "hardware" born of the famous May 1957 "Curtis Report" on airways modernization is due to arrive at Federal Aviation Agency's Atlantic City research center.

This will mark the first tangible evidence of progress toward an ATC system even remotely resembling that needed to match the demands of air traffic today.

The distinction of being No. 1 contributor goes to General Precision Laboratory, Inc. of Pleasantville, N.Y. Its work involves the revolutionary step of eliminating ATC paperwork. GPL's job is to substitute a semi-automatic data processing system and display for scribbled notes on flight progress strips, a most vital step if controllers are to have a fighting chance of handling dense traffic.

Here's how Lt. Col. Carl B. Fisher, Deputy Chief, FAA, Bureau of R&D, looks at the timetable:

First FAA will get "enroute" equipment. A similar system for terminals isn't due until December. In between, about August, Aircraft Armaments, Inc., Cockeysville, Md., is slated to deliver a special simulator that can create a 60-airplane "high density" traffic situation for the GPL equipment to cope with.

If all goes well, FAA expects to learn enough by mid-1961 to give a green light on production of an engineering model of the GPL unit. By January 1963, it hopes to demonstrate "an improved system."

Next comes communication. By August, Radio Corp. of America is due to come up with the prototype of an automatic, two-way, push button, voiceless, air-ground signalling system expected to permit contacts by ATC with up to 500 aircraft every two minutes.

It's called AGACS, pronounced like Ajax, but means Automatic Ground Air Communications System on FAA's books. Plan is to test it for a year, then proceed with engineering models by mid-1961.

Next, 3-D radar

In radar, FAA is pinning its hopes on "3-D," a system that will add elusive height information to the controller's store of knowledge. The W. L. Maxson Corp., New York, has this job, principally on the basis of its novel approach to a "receive only" radar that can pinpoint altitude. Delivery: Oct. 1, 1960.

In radar beaconry, FAA hasn't let the contract yet, but will put development money into a lightweight, simple radar beacon for general aviation aircraft. The money is earmarked for next fiscal year.

In navigation systems, there's big emphasis on helicopters. Although trials with Decca on New York Airways have served their purpose, FAA has additional plans in this field. Could be that Decca will enter into this project, too, although no details are forthcoming from FAA officials at this time.

In weather forecasting, the big step will come in about two months with the award of the development contract for a brand-new, integrated weather gathering and reporting system. USAF has the job of selecting the contractor and bids are due soon. But FAA will oversee the joint military-Weather Bureau-FAA project. It's based on a system (No. 433L) USAF's Cambridge Research Center did the brainwork on.

FAA's airport activity is far reaching, but probably the most controversial area involves the old bugaboo, lighting. With the approach light issue fairly well solved, the talk now is all "narrow gauge," "shadow lighting" and "button" lights.

To thoroughly explore this area, FAA will install Elfaka, Multi-Electric Co. and U. of California button lights at Atlantic City and fly approaches to them with a specially instrumented DC-4.

In another landing aid development, Gilfillan Bros., Los Angeles, has nine months to deliver a new non-visual approach and landing aid. Essentially this involves FAA's search for the future successor to ILS.

In direction finding, Doppler techniques are moving in here too. Servo Corp. of America holds the contract to come up with a new ground Doppler DF.

Probably the most elusive of FAA's targets—a collision prevention system—will gain increased attention soon. In addition to the contract now outstanding with Bendix Radio, FAA has been "weeding out" from some 100 suggestions for an interim collision warning system. It will pick the best six or eight, then put some money into a thorough exploration and possible solution of their known weaknesses.

To further aid this project, FAA is setting up an anti-collision advisory group, hopes to pull the best brains in this field together to come up with an answer. But lacking an answer to date, it is putting stock in the concept that the best insurance against mid-air collisions is an efficient air traffic control system.

Meanwhile the airlines' brand new $5 million jets must fly and FAA's Bureau of Air Traffic Management is sparing no expense to see that they do.

As director D. D. Thomas sees it, the 707s now flying on jet routes are getting more ATC attention and more protection than any aircraft ever had before.

Example: today some 28 FAA crack radar controllers are assigned at each ATC radar site for one purpose: to protect the jets. If American's flight two were to be due say at 2 a.m., he'll be on call. It's an around-the-clock operation. And there are no junior controllers; FAA can't afford to assign anything but the best here.

The worst is over

True, the jets are being harnessed to a few routes today, but Thomas feels the worst is over. As carriers expand services to new cities, FAA is keeping pace. The more services, the more airways and the more options for carriers to choose from in flying from A to B.

The outstanding jet ATC "problem" so far experienced came when an AA 707 was given the option of flying over or under a 10,000 ft. chunk of airspace reserved for SAC for in-flight refueling. This, at first glance, sounds quite unreasonable, but is understandable when one looks at the true situation.

It used to be that SAC had some 50 different areas in the U.S. chalked off for such operations, 24 hours a day, with a 50 by 300-mile "cocoon" built around them.

Some real diligent effort by FAA has cut the number of areas to 20, and they are now protected on a specific time schedule through FAA's Central Altitude Reservation Control in Kansas City.

But with 20 areas in the U.S. and a 50 x 300 mile cocoon needed, it's no wonder that once in a while there's going to be a conflict between USAF and airline plans.

There's one thing different about jet routes from all others. Airlines flying them must be equipped with radar beacon transponders. And military aircraft desiring to cross them too must display their beacon. So far, only one deficiency has shown up; a jet pilot has no way of knowing if and when his beacon stops operating. A ground station tracking the flight must tell him.

In ATC manning, FAA is beginning to reap dividends now from the stepped up activity of two years ago. In March, it showed a net increase of 139 controllers, the biggest number to date. Overtime is now on the decrease, and although it takes 18 months to two years to make a controller proficient, FAA today is no longer plagued with the problem of scraping the employment barrel for warm bodies.

Although the jets never will have the freedom of some 2,500 different coast-to-coast routings enjoyed by piston transports, Thomas sees nothing in FAA's plans that will limit the competitive ability of the carriers to try to outdo each other by better speed, flight planning or routing.

The "three black crows," as controllers refer to American, United and TWA, will still be able to schedule departures within minutes of each other and not be prevented from outflying each other once they get airborne. With a choice of routings and altitudes and even lateral separation at the same altitude, there should be no restrictions on competition.

Thomas' shop is not only tackling the jet route problem. High on its priority list is a project to solve the Southern California area air traffic problem. It's a joint Bureau of R&D, Traffic Management and Facilities effort, and Thomas expects to have the proposed "clean up" program decided in 30 to 60 days. Once the decision is made, any new equipment required will take a bit longer.

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COCKPIT

By CAPT. J. D. SMITH

Senator Warren G. Magnuson, Chairman of the Committee On Interstate and Foreign Commerce, has had prepared a document entitled "Comparative Print Showing Differences Between The Civil Aeronautics Act Of 1938 And The Federal Aviation Act Of 1958." This "Committee Print" should be required reading for all segments of aviation because it clearly points out the changes made to the Civil Aeronautics Act of 1938 and indicates the *intent* of the Federal Aviation Act of 1958.

The FAA Act is extremely unique in that a government agency was required to be completely reorganized by direction obtained during a single session of Congress.

A primary reason for rapid passage of the FAA legislation was the agreement of airspace users that a "single agency" must be clearly responsible for effecting use of the airspace in a safe and orderly manner. During hearings of this bill, various organizations indicated reservations concerning some details of the proposed legislation but agreed that "airspace usage" was in need of urgent improvement; consequently they did not believe it appropriate to satisfy other details at the expense of delaying passage of the needed legislation. It is obvious that "Public Law 726, 85th Congress" (Federal Aviation Act of 1958) came into existence primarily because all segments of aviation agreed that there existed a *serious airspace use problem.*

Postponed Responsibility

Recognizing the extent of the problem related to solving the Air Traffic Control dilemma, the Airways Modernization Board (predecessor to Research and Development, FAA) maneuvered anticipated improvement as concerns its responsibility to "no sooner than 1963." Therefore, the agency established by Congress to solve the airspace utilization problem has, because of previous maneuvering, designed a lengthy period of time during which it cannot be criticised for failing to effect the needed solutions.

When Congress held hearings on the FAA bill, there was practically no criticism of the manner in which the then Civil Aeronautics Administration handled *other than* airspace utilization problems. This lack of criticism normally would indicate that the bulk of the organizations being absorbed would continue unchanged. However, *and quite surprisingly so,* this does not appear to be the case.

Obviously, a reorganization that integrates civil and military personnel is a difficult task. As has oftentimes happened in the past, CAA's regional setup was the initial area for review. Evidently, for the time being at least, this will remain unchanged. But, this decision to leave the regions alone has caused the feeling that something else should be changed.

Now it appears that FAA is going to assign rule-making related to CAR 60 to the ATC Division. This would be appropriate if ATC were fully developed; but bear in mind that FAA itself, through its Administrator, has previously advised that it does not expect to have the answer before 1963. Consequently, such rule-making will tend to be one sided—as has been the case when applied to commercial turbojet operations.

Combining Won't Help

Historically, Government personnel have been assigned as "air-carrier" or "general aviation." The trend now is to combine these people into one unit even though General Aviation has indicated the need for better qualified Government personnel.

Maintenance evidently is scheduled to be segregated from Aviation Safety. This will gain very little, if anything, because this department is faced with enforcing inadequate regulations.

These are but samples of the trend; however, in passing, it should be pointed out FAA also has teams segregating airspace for military/civil use.

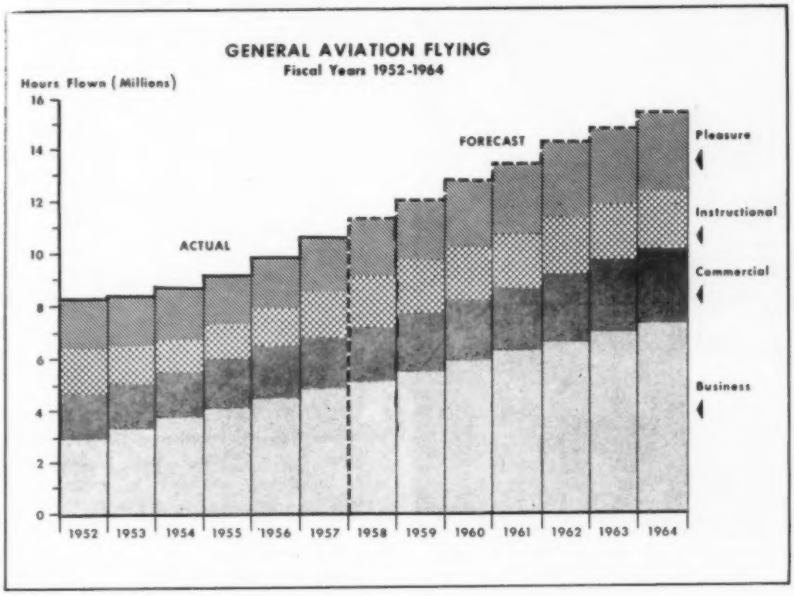
Naturally, as the organization is further expanded, it will become more difficult for the user to understand with whom he is supposed to be working. CAA's structure prior to reorganization was quite sound, even before ATC became a separate department. At least a problem could be approached from a Safety standpoint. As the new philosophy within FAA is expanded, a person can only anticipate being told "Your point is well taken, but we don't have a regulation we can use to help you out."

Inasmuch as the ATC problem will not be solved at an early date, it appears highly desirable that FAA would concentrate on providing its other working level personnel with sound organizational support—particularly as these people are most anxious to perform their assigned duties.

FAA faces a tremendous task keeping abreast of the many changes occurring in both commercial and general aviation. These rapid advances in progress can best be realized by having a well coordinated preventive and monitoring system. Such a system does not exist today.

About COCKPIT

This is the second in a series of columns contributed to AIRLIFT by Capital Airlines' Capt. J. D. Smith. AIRLIFT makes this column available to Capt. Smith as an expression of its interest in the pilots' viewpoint on industry problems and developments. The views expressed are his own. The editors welcome the comments of the readers on the views expressed by Capt. Smith. They should be addressed to J. D. Smith, AIRLIFT, 1001 Vermont Ave., N.W., Washington 5, D.C.



Forecast for 1964: 7.3 Million Hours

Business flying amounted to about five million hours last year, according to FAA's Staff Study for Aviation Forecasts. The report, compiled to help FAA formulate its plans for the next five years, says business flying has more than doubled since 1948 and will reach 7.3 million hours by 1964.

General aviation—business, commercial, pleasure, and instructional flying—logged some 11 million hours last year, more than three times as many as the airlines, and can expect to expand some 23% by 1964, the report says.

Next to corporate flying, commercial operations account for the greatest number of general aviation hours flown. Crop dusting, pipeline patrol, aerial surveys, etc. totaled two million hours of flying in fiscal 1957.

Pleasure flying, perenially accounting for about one-fifth of the general aviation hours flown, is showing promise of growth. About half the aircraft registered in this country are used primarily for pleasure flying, FAA says.

One of the brightest corners of general aviation is instructional flying. After a heavy slump caused by expiration of the GI bill, flying schools are looking forward to 2.2 million hours per year by 1964. Part of this rise is created by private and commercial pilots going on to take advanced or instrument training.

The general upgrading of the aircraft fleet is shown by the fact that last year, during the deepest recession since WW-II, 6,414 new airplanes were sold, including 870 multi-engine units. Many corporations are buying large piston transports released by jet-buying airlines, and other companies are purchasing turbine-powered airplanes.

AiResearch Converts 240 To Ayer-Liner Layout

First executive conversion of a Convair 240 ex-airliner has been completed by AiResearch Aviation Service Div. of The Garrett Corp., Los Angeles. Delivered to Burlington Industries, the airplane was one recently acquired by Frederick B. Ayer and Associates.

Accommodations for 19 passengers include conference table and lounge with swivel-type executive chairs, and two divans convertible to sleeping berths. Other features include fore and aft lavatories, intercom phones, cabin radio, and full galley.

AiResearch also added fuel tanks to the 240's wings, a Sperry A-12 autopilot, Bendix X-band radar, Janitrol ground heating system, and an auxiliary power unit.

14 Business Firms Fly Turbine Aircraft

Business plane operators have nearly as many turbine-powered airplanes as the airlines—but aren't talking as much about it. Presently, 14 corporations are flying a total of 17 turbine airplanes.

The spectre of John Q. Shareholder has frightened most of these operators out of even painting the company name on their airplanes. Although most companies operate near the break-even point or at an actual economic advantage, the necessity of adding a "prestige value" factor to the books to make them balance has made many owners more than a little gun-shy in talking about their airplanes.

Fairchild has delivered the most turboprops to date, with 12 F-27s now in service, and a total of 20 orders received. Current F-27 operators include Noland Co., General Tire and Rubber, Reynolds Metals, Continental Can, Johns-Manville, Westinghouse, Murray Corp., Champion Fiber and Paper, Champion Spark Plug, Butler Aviation (leased to Pepsi-Cola), Ideal Cement, and Kimberly-Clark.

Four Vickers Viscounts are in operation, three with U.S. Steel, and one with Standard Oil of California.

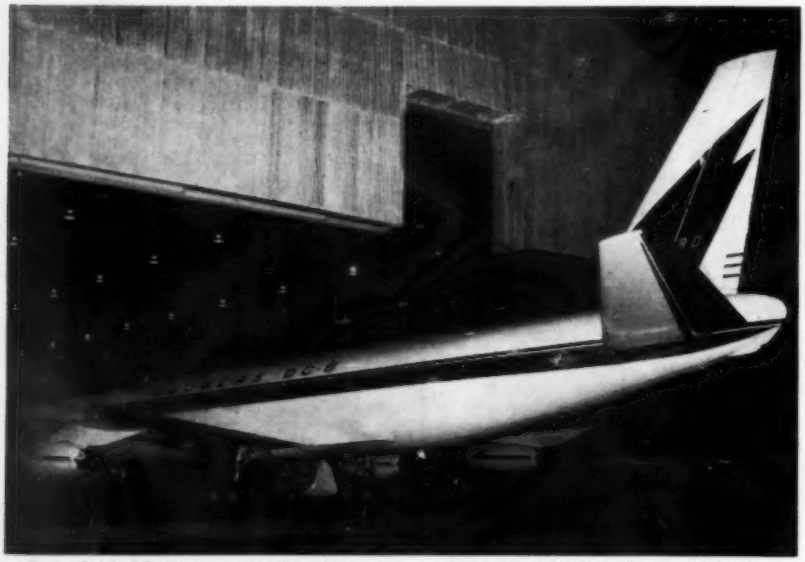
Only pure jet in the executive fleet today is the Morane-Saulnier designed, Beech-constructed MS-760 owned by Henry Timken of Timken Roller Bearing.

Continental Can is the only firm purchaser to date for the JetStar, but Lockheed has received some 70 tentative orders.

Grumman has orders for some 25 Gulfstreams, and will deliver its first airplane to Sinclair Oil Co. this month.

Why Business Aircraft

Oil company executive aircraft operators rate time savings as the key benefit derived from business flying according to a survey by Oil and Gas Journal. Business transport's flexibility for reaching off-line points rated second choice and use in sales programs ranked third.



One of Air Mod's most novel assignments was hangaring the Douglas DC-8 jet transport on its visit in Baltimore last month.

Air Mod Bids for Civil Business

Air Mod, known as one of the world's largest military contract overhaul and modification services, is preparing to launch into the commercial fixed base business.

Construction is still under way on Air Mod's commercial shops which were set up last December at Baltimore's Friendship International Airport. When complete, Air Mod's facility promises to be one of the outstanding caterers of the business flying trade on the east coast.

A radio, radar, and instrument shop will handle every type navigation aid now on the market. Hydraulic test stands are being readied, and an upholstery shop is now open for business.

Complete engine overhaul facilities, capable of handling everything from Cubs to Convairs, are going full speed. "When we get set up here, we'll be able to service any kind of business airplane with anything from a wash job to a 12,000 hr. overhaul," says Air Mod's sales representative, Robert A. Colhoun.

Air Mod's commercial hangar houses a variety of business airplanes and helicopters, and will soon be home to the Vickers Viscount sold as a private plane for the Post corn flakes heiress.

Backbone of Air Mod at present is its military business. The company's main office, located at Cox Municipal Airport, Vandalia, O., handles modification and IRAN of Air Force bombers and fighters based at Wright-Patterson. The Vandalia plant occupies 125,000 sq. ft. in two hangars.

At Dover, Del AFB, Air Mod employs nearly 1,200 people using government furnished equipment and facilties for overhaul of MATS transports. C-124s and C-133s are put through a Progressive Aircraft Reconditioning cycle (PAR), doing overhaul in 2,000 hr. sections.

Spillover from the Dover facility is handled in the military hangar at Baltimore. Paint stripping and remarking, crash damage repair, and general maintenance is provided for a host of aircraft types. Current work involves TACAN installation in C-124s, and fuel cell rework on Lockheed RC-121Cs.

One of Air Mod's biggest projects is a contract with Air Materiel Command. Rather than ferry aircraft to be modified to a centrally-located base, AMC has picked Air Mod to form traveling units, known as Field Service Teams. Air Mod currently has 57 teams at bases all over the world doing on-the-spot IRAN work.

In looking at its future in commercial operations, Air Mod feels the millions of man hours experience gained on similar military projects will prove invaluable, and will turn Air Mod into the foremost fixed base operator in the country.

Mobile X-Ray at LAS

Mobile field X-ray for business aircraft has been put in operation by Lockheed Aircraft Service at New York International Airport.

The X-ray unit will be used to measure growth of known fatigue cracks by exposing plates at normal progressive overhaul period and comparing with previous plates.

LAS will also offer X-ray service to owners who think their airplane may have suffered structural damage in turblence or landing.

New Shops Open

Two new fixed base operators have opened shop within the last month.

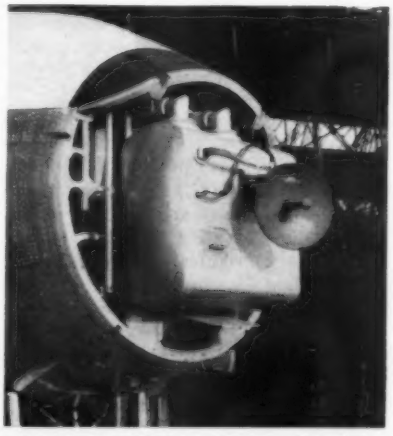
One is Air-O-Fleet, Inc., headed by Alex Seskin. Company is located at Bay 7, Hanger 1, Detroit-Willow Run Airport. Seskin is also an authorized Beech distributor.

Other firm is Delaware Aviation with operations based at North Philadelphia Airport, Philadelphia. Delaware has APU starting and maintenance shops open 24 hours a day. Company is Piper and Lycoming distributor.

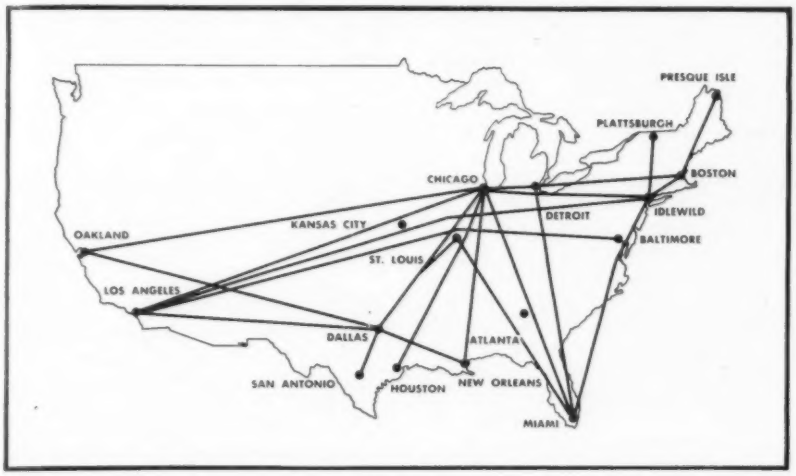
Radar for Retrofit

RCA Great Britain, Ltd. in association with Marshall's, Cambridge, British aircraft overhaul company, is marketing an aircraft retrofit program for RCA AVQ-50 airborne weather radar.

A special kit has been designed to fit any aircraft from "a Beech Bonanza to the Convair 440" in a few days. Cost of kit is $11,242 with 160-mile indicator or $10,640 with 80-mile list.



RCA radar fitted in Viscount by Marshall's, Cambridge, England overhaul agency. Unit is Model AVQ-50.



Five are now in service. Jet routes in U.S. already "cleared" for operations in 1959.

Where Airports Stand for Jets

By MEL SOKOL

By the end of 1962, some 77 U.S. airports will be receiving jet service. At present, only 23 have runways of sufficient length to meet projected traffic needs and 44 lack adequate terminal facilities. Bleak as the picture looks, it is more on the surface than in actuality for airport officials are engaged in the biggest construction program in history.

To date, only five cities are being served by the jet-powered transports. They are New York (through Idlewild airport), Chicago (through O'Hare), Los Angeles, San Francisco and Miami. With the delivery of more jets, airlines are planning to inaugurate service to these additional points during 1959: Newark, Windsor Locks, Conn., Tampa, New Orleans, St. Louis, Boston, Baltimore, Miami, Atlanta, Detroit, Kansas City, Dallas/Ft. Worth, Portland, Denver, Houston, Seattle.

Here's how they stack up on runways. Idlewild's 11,250 ft. ILS runway tops the FAA's recommended length of 11,100 ft. for takeoff on nonstop transatlantic flights. Newark has 7,000 ft., which may be adequate for short domestic hauls but will need to be extended to 10,200 ft. to qualify for intercontinental service. Atlanta, St. Louis, Kansas City, Seattle, and Detroit-Wayne Major are ready to take the jets.

Chicago, which recently extended O'Hare's ILS runway to 8,835 ft., can be served as an intermediate on transcontinental flights. It currently is embarked on a $120-million expansion program, which when completed in 1962 will provide runway, taxiway, hangar and terminal building facilities adequate to meet estimated traffic needs through 1965.

Miami, San Francisco and Los Angeles all are extending their runways, although 707 operations at each so far have been conducted satisfactorily with present facilities. San Francisco is upping its runway lengths to 9,500 ft., 9,000 ft., and 7,130 ft., from a present maximum 8,870 ft. Los Angeles expects to have a 10,115 ft. runway completed by July, paralleling its existing 10,000 ft. runway. Miami plans to add 1,100 ft. to the existing 9,400 ft. runway provided for jet takeoff. Tampa, too, is building more runway.

While Denver will require an 11,300 ft. runway for nonstop flights to New York, the existing 10,500 ft. will be adequate for Denver-Chicago jet service due to be inaugurated early this summer.

In addition to terminal airports, some 24 alternates have been designated for civil jet service in 1959. These include the following: Syracuse, Pittsburgh, Cleveland, Dayton, O., West Palm Beach, Mobile, Ala., Milwaukee, Salt Lake City, Amarillo, Tex., Tucson, San Diego, Spokane, Buffalo, Philadelphia, Columbus, O., Jacksonville, Fla., Memphis, Indianapolis, Omaha, San Antonio, Tulsa, Phoenix, Sacramento, Boise, Idaho.

Critical runway length for alternates is for landing. Most have the minimum 6,300 ft. deemed necessary in case of a jet landing due to weather or other emergency short of terminal destination. Eleven have adequate runways for takeoff.

These include Birmingham, Charlotte, Knoxville, Memphis, Albuquerque, Las Vegas, Syracuse, West Palm Beach, Tulsa, Tucson and San Diego. Both Tucson and Phoenix are expanding terminal facilities. San Diego's chances of getting transcontinental jet service are slim unless a site can be located for a new airport.

Additional terminal airports slated to receive jet service in 1960 are: Albany, N.Y., Shreveport, La., Knoxville, Tenn., Minneapolis, Alburquerque, N.M., Las Vegas, Nev., Charlotte, N.C., Orlando, Fla., Jackson, Miss., Louisville, Ky., Oklahoma City, Oakland, Calif., Birmingham, Ala., Cincinnati.

Minneapolis will add $29 million to the $11 million already expended on Wold Chamberlain International Airport. Construction plans call for an $18-million overhaul base for Northwest Airlines, an $8.5-million terminal, a 9,600-ft. runway, plus extension of the present 6,500-ft. runway to 9,000 ft.

Port of Oakland (Calif.) is completing preliminaries for a $17.5-million airport expansion program which will include a new terminal building, a jet airliner runway, a separate airfreight building, heliport, parking lot, roadways and taxiways. All will be built a mile out in San Francisco Bay on 600 acres of filled land. The new runway will have two miles of unobstructed overwater approaches at each end.

Completing the list of terminal airports designated for jet service by the end of 1962 are: Billings, Mont., Little Rock, Ark., Des Moines, Iowa, Moline, Ill., Ft. Wayne, Ind., Evansville, Ind., Raleigh/Durham, N.C., Columbia, S.C., St. Petersburg, Fla., Reno, Nev., El Paso, Tex., Peoria, Ill., South Bend, Ind., Terre Haute, Ind., Nashville, Tenn., Greensboro/High Point, N.C., Charleston, S.C.

Not included in the list, although slated for completion by 1962, is the new Washington International Airport at Chantilly, Va., the world's first airport to be designed from the start for commercial jet aircraft and passenger requirements. Terminal design has not yet been completed but will employ a new "mobile lounge," providing complete separation between terminal building and parked aircraft. Two N/S 11,500-ft. runways are planned and two 10,000-ft. long SE/NW runways. Pending the opening of the airport at Chantilly, the nation's capital will be served by jets through Baltimore Friendship Airport. The latter is capable now of handling jets, but another $10 million will be spent on runway and other improvements.

By FRED S. HUNTER

UP TO NOW, Western Air Lines has taken what might be called a dispassionate view of the jet equipment situation. It has known all along that eventually it would have to pick a turbojet airplane, but, meanwhile, there was no great hurry to sign on the dotted line and make a down payment.

There were no great competitive pressures to force the issue; the airline was keeping its DC-6B champagne flights filled with happy passengers, it had the funds available to pay for the Lockheed Electra turboprops it had on order, and the longer it could wait before making a turbo-jet commitment the more favorable its financing position.

The time, however, is beginning to approach when the WAL board will be called upon to make the big decision. As things stand now, the Boeing 720 seems likely to be WAL's choice, although Convair has by no means given up hope of landing the order with its 880. WAL is showing little interest in turbofan developments at this time. For its particular route structure, turbofans, apparently, offer no advantage.

No Long Stage Lengths

WAL's longest route is Mexico City, 1,555 miles, fine for the Electra or for a turbojet in the category of the Boeing 720 or Convair 880. Its longest flight within the U.S. is its Los Angeles-Seattle nonstop, 957 miles, also highly suitable for the Electra. WAL will be first with new-style equipment on this route with Electras, starting August 1, or perhaps even earlier, as indications are Lockheed will accomplish delivery of WAL's first airplanes ahead of schedule. It will get an equipment jump on its principal competitor, United Air Lines, on another route, San Francisco-Salt Lake City-Denver, on which it probably will inaugurate Electra service about the same time it does between Los Angeles-San Francisco-Seattle.

A happy fella is Bob Prescott, Flying Tiger president, flying the DC-8.

The Electras are certain to take business away from UAL's DC-6 and DC-7 trips. But UAL will begin getting Douglas DC-8s this fall, and later, Boeing 720s. The DC-8 might seem to be a pretty big airplane for a 957-mile segment, and also a pretty big airplane to fill both ways on a route of the character of Los Angeles-Seattle. But bear this in mind. A flight to Seattle and back might very well be fitted in between Los Angeles-New York transcontinentals for a substantial gain in aircraft utilization. And with its operating base in Denver and its engineering and maintenance base in San Francisco, we don't think UAL will stand still very long for WAL to have the better schedules between the two points.

New Airplane, Old Problem

When American Airlines added its third Boeing 707 nonstop schedule between Los Angeles and New York, the first Los Angeles departure went out with three empty seats—one standard fare, two coach. "How do you like that?" groaned Bill Hipple, AA's western regional director of public relations. "I had 20 people trying to get on that flight." Ever since AA began flying its new jetliners, the demand for seats has exceeded the supply. But jets or no jets, the no-show is still with us. AA meticulously shakes down its reservations list on every 707 trip leaving Los Angeles, but come check-in time and passengers, who were "firm" only a few hours before, unaccountably disappear. Happily, because of the great demand for space, AA normally has enough stand-bys to compensate for its no-shows on its 707 flights, but, every now and then, the ratio goes out of kilter. That's why AA's 707 load factor is around 95% instead of 100%.

European Version

AiResearch Manufacturing is mounting one of its gas turbine units for jet engine starting on a Volkswagon for KLM to try out. If it works out satisfactorily, a deal may be made for KLM to produce the unit in Amsterdam under a licensing agreement. AiResearch makes two versions of the gas turbine unit, which may be used either for turbojet or turboprop engines. Its GTC-90 supplies low pressure air for starting. Its GTC-91 includes an electrical power unit so that ground power to the airplane may be supplied from the same vehicle. The 75 GTC-91s AiResearch sold to Eastern Air Lines for its DC-8-Electra fleet are mounted on GMC trucks.

Turbines For Cargo

Bob Prescott, president of The Flying Tiger Line, a turboprop man in the company discussions of what comes next equipment-wise, almost became a turbojet man when Douglas took him on an inspection flight in the DC-8 and he took a turn at flying the airplane from the right-hand seat. Pilot Prescott loved it. "One of the great experiences of my life," he exclaimed. This is high praise, indeed, as Prescott is a man with a wealth of experiences, ranging from flying for the original Flying Tigers in China to the air freight battle in Washington, and including some real hair-raisers on the golf course at the Lakeside Country Club when some expensive putts did or did not drop.

Douglas has its eye on the Tiger Line as a prospect for a cargo version of the DC-8. This is its Model 1920 Jetmaster, incorporating P&W's advanced JT3D-2 turbofan engines and a lateral swinging tail. But at this time Prescott leans toward a turboprop, possibly Canadair's CL-44. He feels it would be more flexible for the Tiger Line's particular routes.

Turbofan Prospects

Based on past experience, this should be re-order time in the transport market. Airlines buying a new airplane try to order conservatively, then add to the order later if need be. But some of the airlines that bought Boeing 320s or DC-8s powered by P&W JT4A engines are wondering if they should reorder the same type plane to meet any additional requirements or if they should change over to the forthcoming P&W JT3D-2 turbofan. Seattle reports indicate Boeing might be able to accomplish FAA type certification of a 707 incorporating the turbofan powerplants in January, 1961. Douglas, reportedly, could have a turbofan DC-8 certified by March or April, 1961. The turbofan version of the JT3, reports have it, will develop around 17,000 pounds thrust, or more than the JT4A, and there is also the advantage of lower fuel consumption.

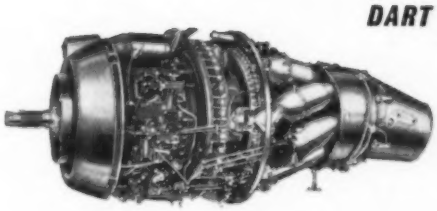
ROLLS-ROYCE

GAS TURBINES

are in service with or on order for

OVER 60 AIRLINES

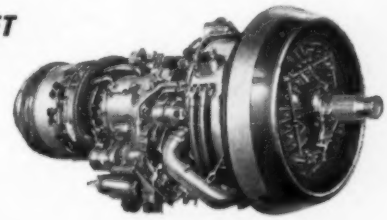
DART PROP-JET



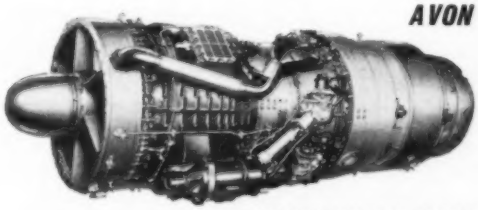
In service or under development at powers ranging from 1,540 e.h.p. to 3,200 h.p. The Dart is the most proven prop-jet in the world and has flown over 7,000,000 hours in scheduled airline service. It has an unexcelled record of reliability and is currently operating at overhaul lives of up to 2,300 hours.

TYNE PROP-JET

The Tyne is an advanced twin spool high compression engine due to enter service in 1960 at ratings of 4,985, 5,525 and 5,730 e.h.p. It has been designed to give low specific fuel consumption and is backed by the unique experience gained by Rolls-Royce in the operation of gas turbine engines in scheduled airline service.



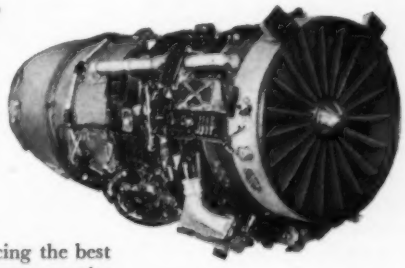
AVON TURBO JET



The Civil Avon has been developed to give low fuel consumption and long life between overhauls. The British Air Registration Board authorised its entry into service at an overhaul life of 1,000 hours.

CONWAY BY-PASS TURBO JET

The Civil Conway has the advantages of low first cost and operating costs, low weight, less noise and low specific fuel consumption. Initial Civil Conways have a guaranteed minimum thrust of 16,500 lb. and engines of 17,500 lb. and 18,500 lb. guaranteed minimum thrust, will be available.



RB. 141 BY-PASS TURBO JET

The RB. 141 has been designed with the objective of producing the best possible commercial engine for sub-sonic transports making no compromise with military requirements. The thrust of the new engine and its variants will be in the range of 12,000 to 16,000 lb. and engines with take-off thrusts of up to 14,300 lb. will be available in 1962.

Aer Lingus · Aerolineas Argentinas · Aerovias Ecuadorianas C.A. · Air Algerie · Air France · Air India International · Airwork · Alitalia Aloha Airlines · Ansett A.N.A. · Austrian Airlines · Avensa · Aviaco (Spain) · Bonanza Air Lines Inc · Braathen's S.A.F.E. · British European Airways · British Overseas Airways Corporation · British West Indian Airways · Butler Air Transport · Capital Airlines Central African Airways · Compania Cubana de Aviacion · Continental Air Lines · Eagle Aviation · East African Airways Corporation Finnair · Hong Kong Airlines · Hunting-Clan Air Transport · Icelandair · Indian Airlines Corporation · Iraqi Airways · K.L.M. Royal Dutch Airlines · La Nica · Linea Aeropostal Venezolana · Lufthansa · Middle East Airlines · Misrair · New York Airways · New Zealand National Airways Corporation · Northeast Airlines · Northern Consolidated Air Lines Inc · Ozark Air Lines Inc · Pacific Air Lines Inc Pakistan International Air Lines · Persair (Iranian Government) · Philippine Air Lines · Piedmont Aviation Inc · P.L.U.N.A. (Uruguay) Quebecair Inc · Riddle Airlines · Royal Air Maroc · Scandinavian Airlines System · South African Airways · Sudan Airways · Swissair Taca (San Salvador) · Transair · Trans-Australia Airlines · Trans-Canada Air Lines · Trans Mar de Cortes S.A. (Mexico) · Turk Hava Yollari · Union of Burma Airways · VARIG · VASP (Brazil) · West Coast Airlines Inc · Wien Alaska Airlines Inc.

ROLLS-ROYCE LIMITED, DERBY, ENGLAND

AERO ENGINES • MOTOR CARS • DIESEL AND GASOLINE ENGINES • ROCKET MOTORS • NUCLEAR PROPULSION

Circle No. 48 on Reader Service Card.

ALIVE TODAY!

Arch Lightbody, like 800,000 other Americans, is cured of cancer. Like 800,000 other Americans he went to his doctor in time—in time for early diagnosis and prompt and successful treatment. He learned that many cancers are curable if detected in time.

You can do two things to defeat cancer: Have an annual health checkup. Be alert to the 7 danger signals that could mean cancer:

1. Unusual bleeding or discharge. 2. A lump or thickening in the breast or elsewhere. 3 A sore that does not heal. 4. Change in bowel or bladder habits. 5. Hoarseness or cough. 6. Indigestion or difficulty in swallowing. 7. Change in a wart or mole. If your signal lasts longer than two weeks, go to your doctor to learn if it means cancer.

AMERICAN CANCER SOCIETY

PAR AVION

By ANTHONY VANDYK

• **Cabotage okay in Europe**—Germany is the most liberal of all countries in the granting of cabotage rights to foreign carriers. The Bonn government is permitting nine foreign carriers this summer to carry traffic between German airports. In fact, about 60% of the three million seat-miles offered by foreign airlines on flights within Germany this summer have unlimited cabotage rights. The lenient policy of the Bonn government has resulted in foreign carriers operating short-sector routes through Germany. Almost half of the capacity offered by foreign airlines flying through Germany involve sectors of not more than 120 miles. The airlines involved certainly would not operate such short sectors if they did not have cabotage rights. Switzerland is another European country which is generous with cabotage rights, although distances between the Swiss cities are so short that the value of these rights is not too great. This summer British European Airways has been granted cabotage rights between Zurich and Basle (48 miles), while KLM enjoys similar rights between Zurich and Geneva (144 miles) and Basle and Geneva (116 miles).

• **MASCO is big business**—Almost certainly the largest industrial employer in the Middle East is an aircraft overhaul organization known as Mid-East Aircraft Service Company—MASCO for short. Recently, we had an opportunity of talking with MASCO's general manager, George J. Carayan, and visiting the company's new, almost-completed facilities at Khalde airport, Beirut. Incidentally, the resemblance between the MASCO facilities and those of SALA at El Coco airport, San Jose, Costa Rica, is most striking, although the MASCO set-up is much larger. The two hangars in the MASCO facility are each 179 ft. long and 213 ft. wide, while the engine overhaul shop alone covers 54,000 sq. ft. Owned 48% by BOAC and 52% by Lebanese interests, MASCO carries out all airframe overhaul and maintenance work for Middle East Airlines and Kuwait Airways, as well as handling line maintenance and other work for about a dozen other carriers. When it moves into its new facility later this year, MASCO will also do Dart engine overhauls. At the time MASCO was created in 1955 it was hoped that most carriers in the Middle East, particularly those operating Viscounts, would use the company's facilities for their overhaul and maintenance work. Political circumstances have been mainly responsible for MASCO's business not developing quite as rapidly as anticipated. But with some $7 million invested in the project, the sponsors of MASCO are optimistic that the new 600,000-sq. ft. facility and its 1,000-man labor force will be fully occupied in the years ahead.

• **Changes for Austrian Airlines**—What is ahead for Austrian Airlines? One thing is certain—many changes. Although it is only one year old, the company is heading for a shake-up as a result of the heavy losses it has sustained and the political differences between its two chief executives. There are two main possibilities. One would involve the carrier becoming part of the SAS-Swissair consortium, a development which would not be too difficult to realize in view of the fact the SAS is the major foreign stockholder. The second possibility is that Pan American will acquire a substantial interest and will equip the airline with Lockheed Electras. At the moment, Austrian Airlines has no equipment of its own and operates four Viscounts leased from Norway's Fred Olsen (giving it the distinction of becoming the world's first airline to operate an all-turbine fleet). Although lack of an aggressive sales organization resulted in disappointing traffic figures, the carrier can be proud of its operational record for its first year of existence—some 99% of all its 2,584 flights were on the schedule and not a single one was delayed for technical or operational reasons.

• **Comet is deceptive**—Not since the Convair 240 has there been any aircraft with so much "get up and go" as the Comet 4. The takeoff in the de Havilland jet is a most impressive experience. Looking out of the window during the steep climb immediately after the aircraft gets airborne, one has more of an impression of being in a helicopter than in a 156,000-lb. transport. If he does not look out of the window, the only indication that the passenger has of the power the four 10,500-lb. Rolls-Royce Avons are generating is the angle of 25° from vertical at which the curtains separating the various compartments incline during the climb away phase. Recently, we sampled the Comet 4 on one of the inaugural services of BOAC's London-Tokyo route and had an opportunity of observing the aircraft's ability to get in and out of difficult airports with full load under adverse conditions. In fact, the Comet 4 can operate almost without restriction to all but three (Kuwait, Colombo and Kuala Lumpur) of the 23 airports between London and Tokyo served by BOAC.

• **Swissair earns applause**—Businessmen will applaud the initiative of Swissair in devising a "Sample Collection Service" under which the carrier takes over a multitude of chores in connection with international journeys where the traveler has to take samples with him or have them on hand at his destination. Swissair prepares all the customs documents and, if necessary, makes the money deposit required by certain customs authorities. At each city on the traveler's itinerary the airline designates an agent to meet him and make sure that his samples get through customs with the minimum of delay and formality. Swissair believes that this service will be particularly valuable to travelers who have to take scale models, movie projectors and screens along with them as part of their sales presentation.

SALES TALK

By ERIC BRAMLEY

Mohawk's Steady Passengers Buying Tickets By The Book

A unique on-line air travel account, which saves time for the customer and eliminates the need for ticket agents to compute fares, has been introduced by Mohawk Airlines.

Each travel account customer now receives a plastic holder, similar to a check book, containing 20 "flight tickets." He makes his reservation as usual; then, when checking in for the flight, simply signs and presents one of the tickets—which is a standard 80-column IBM card. The agent validates it, fills in destination, flight number, date, one-way or roundtrip—but doesn't compute the fare.

When returned to Mohawk's data processing department, tickets are punched with origin, destination, date, etc. Next, they are reproduced into a working deck which is matched with the master origin-destination fare deck, and the fare is applied to the working cards. Billing is then completed and tickets accompany the statement back to the customer as his receipts. The 16th ticket in each deck has an additional punch telling the airline it is time to issue a new book of 20 tickets to the customer.

TWA Adding More Paper Work, But Novel Idea Saves Money

Much wider use of disposable cabin service items—eliminating laundering and pilferage—is being made by TWA on its Boeing 707 jets.

Dura-Weve, developed by Scott Paper Co., Chester, Pa., is now used for meal tray mats. Made of specially-processed paper laminated to an inner ply of rayon scrim, the mats have a gripping action that prevents movement on the tray. They have a tweed pattern and a woven appearance, and soak up juices, coffee, etc., that tend to run on hard paper mats.

Disposal paper utility "cloth" is used by TWA hostess Georganne Riley to wipe a plate. Tweed-patterned paper meal tray mat is also discarded after use.

Hand towels of the same material are used in washrooms to supplement cloth towel service, and TWA estimates that laundering and handling expense has been cut 50% in this department. In the galley, hostesses are using Dura-Weve utility "cloths" for polishing and wiping purposes.

After landing, the mats, towels and cloths are discarded, and TWA believes the disposability feature will help reduce service time. The company is considering use of disposable headrest covers, pillow cases, hostess aprons, aisle runners and rain ponchos for disembarking passengers.

Everyone a public relations man is American Airlines' aim. Ticket sales, cargo, ticket lift/ramp, airport services and station agents are being schooled in public relations by means of a series of short discussion meetings. Training is being conducted by Silas Dean Organization, Denver pubrel firm.

"Change of plans telephones" are being used by National Airlines in New York and Miami. Passengers call special numbers to change their flight plans, cancel or reconfirm. The numbers are being distributed by means of "convenience cards" with all ticket purchases.

A better way to ship perishable cargo has been devised by Northwest Airlines and Green Bay Box Co. A new fibreboard container coated with plastic and aluminum foil and called "Preserv-a-Pak," utilizes the principle of a thermos bottle, permitting stowing in unheated compartments. It will be made available to shippers this spring at moderate cost.

One of the best promotional folders seen in some time is Scandinavian Airlines System's "Flight Into Tomorrow," featuring the DC-7C, DC-8 and Caravelle. Rich colors, good illustrations and cutaway drawings . . . Another good job is Air France's folder on the Caravelle . . . A special version of the comic strip "Peanuts" is being used in a direct mail piece by Allison Division of General Motors and American Airlines to explain how a prop-jet works. Very cleverly done . . . Complete tour folder of Alaska is being distributed by Pacific Northern Airlines. It lists over 100 tours to and within the new state, with price information. . . .

A broad hint by Swissair: "Liquor is not served to economy class passengers, but ice, mineral waters, water and glasses are available for setups."

A $41,061,000 goal for vacation and pleasure travel revenue in 1959 has been set by Capital Airlines. With its new Florida route, the company's aim is to sell 15,000 package vacations to Miami from nine of its principal cities.

Ticket salesmen are on their toes at American Airlines. Anonymous "shoppers" are making simulated passenger contacts each week at 10 ticket offices, selected at random. A committee headed by executive vice president-sales Charles A. Rheinstrom judges the shoppers' reports. Two best ticket salesmen each receive $50 cash. AA has been doing the same thing with telephone reservationists, using recordings for judging.

Passengers are asked to help Delta get new customers. The airline includes in its seat packets special cards on which passengers are asked to write names of friends who might be interested in flying Delta. Letters are written to the prospects —and individual letters go to the passengers who furnished the names, thanking them for their help. A number of definite reservations have been secured by this method.

New flight numbering system is being adopted by TWA with introduction of jets. Numbers 1 through 99 are reserved for the Boeing 707. Nonstop New York-Los Angeles flights will be numbered 1 through 19; Chicago-Los Angeles, 20-29; Chicago-San Francisco, 30-39; New York-San Francisco, 40-49. Remaining numbers are reserved for other segments as service is introduced.

Monthly customer service award has been established by Pan American's Latin American division. All employes are eligible; prize is $25 a month . . . TWA says that the biggest passenger service program in its history is now underway. Theme is "The Customer is King."

Biggest advertising switch in a long time sees American Airlines' account go to Young & Rubicam Inc., effective June 1. Lennen & Newell had handled it for four years . . . Guest Aerovias Mexico named Adams & Keyes as its ad agency (company was formed Apr. 1 by merger of Burke Dowling Adams Inc. and St. Georges & Keyes Inc.).

Here's Pan American's new procedure for passengers traveling from Latin America to Europe via New York: if Idlewild layover is less than four hours, passengers are accommodated in the Clipper lounge in the international arrival building; four to 12 hrs., they're taken to International Hotel on the airport and provided with rooms and meals; overnight layover, accommodations at International or a New York hotel. Economy class passengers pay their own expenses for these services (an IATA rule).

Here's a new gimmick: South African Airways in the near future will have "canned" music aboard its planes—with advertising. Each passenger will have a headphone. Programs and equipment will be provided by an advertising company which charges $1.75 for a 20-word "spot" during the programs. SAA will monitor to make sure that the spots don't come too frequently.

Seaboard & Western Can Fly Mail Across Atlantic

Seaboard & Western Airlines has won its fight for the right to carry mail across the Atlantic.

CAB, by a 3-2 vote, approved amendment of the cargo line's certificate to haul mail on a non-subsidy basis. Vice Chairman Chan Gurney and Member Harmar Denny dissented, claiming the service was not required and that traffic would be diverted from Pan American and TWA. The majority said that certificating S&W would not have serious effect on these carriers.

S&W had started to carry mail on May 27, 1958 under a temporary exemption granted by CAB. In November, 1958 the U.S. Court of Appeals set aside the exemption. The Supreme Court refused to review the case, and S&W stopped carrying mail Feb. 24, 1959. The new certificate amendment is good until Aug. 15, 1960, when S&W's Atlantic permit expires.

CAB Turns Down IATA Pacific Fare Boost Proposal

CAB has refused to approve an IATA resolution proposing a $50 increase in one-way first-class fares over the north and central Pacific.

Fares thus remain open on these routes. IATA can close them by taking a mail vote on the question of reverting to previous fares. Rates were open on the Pacific in 1953, but no rate war developed.

In disapproving the resolution, CAB said that recent operating results of U.S. flag carriers serving the routes do not provide economic justification for the increase.

Board May Photograph Airline Files for Evidence

Despite strong protests from the carriers involved, a CAB examiner has ruled that the Board can photograph airlines' files and introduce them as evidence at a hearing.

The ruling was made in the Pan American-National case involving jet leases and stock exchange. CAB agents had made unannounced visits to PAA and NAL offices in Miami, New York and Washington, inspecting and photographing documents (AIRLIFT, April).

Examiner Leslie G. Donahue, in admitting photographs of documents, said there have been long-standing CAB procedures which have not been challenged as to the right to introduce such material.

Pan Am had argued that the recent inspection differed from past inspections of its files in that it involved "unprecedented use of the Board's powers" for a "general fishing expedition" with "indiscriminate access to all files," including attorneys' privileged preparation documents. It added that documents obtained are clearly subject to the limitation that they cannot be revealed except by special order.

National said power to inspect is granted by the Act but power to copy material is not included. Only the Board, not its staff, has power to inspect documents, etc., and it did not delegate that power, NAL added.

ROUNDUP OF ACTIONS

APPLICATIONS

Capital Airlines has asked for expeditious hearing and decision on its application for a new route segment between Buffalo, N.Y., and Toronto, Canada.

United States Overseas Airlines has applied for a certificate to operate between the co-terminals San Francisco/Oakland and Los Angeles/Burbank and various points in Hawaii. USOA, now operating as a supplemental air carrier, asked for consolidation of its application into the transpacific route case.

Trans World Airlines has amended its previous application for renewal and change of its certificate, to add Tokyo as a co-terminal with Manila and to make Hong Kong an intermediate between Bangkok and Tokyo. It previously had asked to serve Hong Kong as a co-terminal with Manila, which it now serves. Also in the transpacific case, Northwest Airlines amended its application to revise its list of U.S. co-terminals to include New York, Washington/Baltimore, Philadelphia, Boston, Detroit, Chicago, Los Angeles, San Francisco, Portland and Seattle, plus several Air Force bases. Bonanza Air Lines asked to intervene in opposition to an Alaska Airlines application which includes a Reno-Las Vegas route.

Samoan Airlines Ltd. has asked extension of its present authority to operate between Pago Pago, American Samoa and Apia, Western Samoa. The company has authority to serve the points until June 8, 1959, but has never started service.

Continental Air Lines has filed tariff application for a deluxe service charge in both first-class and coach compartments of Boeing 707s, which start service June 8. Charge would be $7 one-way Chicago-Los Angeles, $6 Kansas City-Los Angeles, $4 Chicago-Denver and Denver-Los Angeles, $2 Chicago-Kansas City.

Allegheny Airlines has asked permission to operate between New York/Newark and Washington/Baltimore with two intermediate stops instead of the presently-required three.

Emery Air Freight Corp. has asked permission to acquire control of a subsidiary, Emery Air Freight International, S.p.A., to be created and incorporated under the laws of Italy. Emery said it recently decided to expand its international operations.

ACTIONS

CAB has issued a supplemental opinion, following petitions for reconsideration, in the Great Lakes-Southeast Service Case. It granted Eastern Air Lines direct service from Raleigh-Durham, N.C., to Pittsburgh, Akron, Cleveland and Detroit, saying omission of such service in the original certificate was inadvertent. EAL also received authority to originate Chicago and Cincinnati flights at Raleigh-Durham, Greensboro-High Point and Charlotte or points south. The company will be allowed to carry local traffic between Charlotte and Raleigh-Durham but not between Raleigh-Durham and Greensboro-High Point.

National Airlines has received authority to serve Melbourne, Fla., as an intermediate on Miami-West Palm Beach-Tampa-Panama City flights, until 60 days after final CAB decision in the Southeastern Area Local Service Case.

Transocean Air Lines was given permission until Dec. 31, 1959 to operate for Lufthansa two weekly roundtrip cargo flights New York-Frankfurt. TOAL will supply 1049-H Constellation equipment; Lufthansa will pay $2.30 per statute-mile flown. CAB said continued approval of such an arrangement should not be anticipated.

CAB has amended its economic regulations to reduce from one year to three months the time during which carriers must keep records and reports on errors, oversales, irregularies and delays in handling passengers.

CAB has excluded from the Cincinnati-Detroit Investigation an application by Eastern Air Lines for a Louisville-Detroit route and one by Lake Central for service to Lima and Mansfield, Ohio. It allowed EAL, North Central and Piedmont to file applications for a Cincinnati-Detroit segment.

MAIL RATES

New York Airways' rate of return on investment has been set at 9.5% instead of 8%, effective Apr. 3. CAB refused a NYA petition to make the rate effective July 1, 1958. Under the new mail rate order, NYA will receive $8,895,916 for the period from Apr. 1, 1959 through June 30, 1963 ($8,488,482 subsidy, $407,434 service pay).

Allegheny Airlines' temporary mail pay will be set at $9,585,506 for the period Apr. 1, 1955 to Oct. 31, 1958, according to a CAB show-cause order. Pay would be at annual rates of $3,040,320 for Nov. 1, 1958 through Feb. 10, 1959, and $2,940,320 for Feb. 11, 1959 through June 30, 1959. After July 1, 1959, pay will be at the current rate of $2,537,018 annually.

Frontier Airlines' temporary pay was set at $2,776,805 for Oct. 1, 1957 through Sept. 30, 1958, and $2,844,138 for the year beginning Oct. 1, 1958.

Wanted: Lighter X-Rays for Maintenance

Delta's Albert Edwards puts X-Ray to use. He's considered one of the best.
Photo: Delta Air Lines

Frank George of UAL-San Francisco studies X-Ray of aircraft section.
Photo: United Air Lines

This portable Andrex X-Ray machine helps Delta cut maintenance costs.
Photo: Delta Air Lines

Airline engineering and maintenance technicians are 100% sold on the value of modern X-Ray techniques to speed structural inspections, but that doesn't mean there isn't room for improvement.

In an *AIRLIFT* survey of four major X-Ray users—American, Delta, United and Northwest—three strongly urged development of lighter and more powerful equipment to suit their needs. Only Delta expressed complete satisfaction with the status quo.

Here's how use of the new super inspection tool stacks up among the airlines surveyed:

At American Airlines, use of X-Ray has expanded beyond the walls of its overhaul shop. AA employs Norelco 160 KV equipment built by North American Philips Co., New York, has two machines at Tulsa overhaul, one at La Guardia and rents a machine at Idlewild. It is considering buying a 260 KV Norelco unit for Idlewild, uses its field units to conduct fleet campaign inspections.

American was one of the first carriers to turn to X-Ray back in 1951, using laboratory type equipment to inspect all the hollow steel propeller blades on its DC-6s and Convairs. General use of portable equipment for inspection began at AA in 1955.

AA maintenance officials cite big savings using X-Ray. On inner wing structural checks of DC-7s at wing station 60, X-Ray does the job in 1.5 manhours. Otherwise, a visual inspection requires 120 manhours.

Inspection of DC-7 wing stringers in boxbeam and bellcrank compartments takes 60 hours visually, only three manhours with X-Ray.

American looks to X-Ray manufacturers to cut the weight of the "portable" equipment and at the same time increase its power. It figures X-Ray now costs an average of $1.75 per picture based on 100 pictures and 50 manhours.

Delta Air Lines, first of the U.S. carriers to employ X-Ray for routine inspection, bought its first equipment early in 1954. It uses both Andrex 160 KV and 200 KV units produced by Holger Andreasen of Copenhagen and San Francisco, Calif.

The carrier also employs special X-Ray diffraction equipment to detect possible residual stresses in aircraft components that could ultimately lead to fatigue failure.

Delta uses X-Ray at overhaul but sometimes extends this usage to terminating line stations for special inspections. It estimates X-Ray costs at $3.00 per photo, feels the equipment now available on the world market is entirely adequate for its purposes.

United Air Lines, another frontrunner in the use of X-Ray inspection, has employed the technique since 1954. Its policy is to use X-Ray when it feels it is the best method of making an inspection. UAL figures X-Ray pictures cost anywhere from $1.00 to $50.00 depending on the nature of the exposure.

United now owns a single Norelco MG-160 unit and confines its utilization to the overhaul shop. Its maintenance officials look for a reduction in size and weight of X-Ray units without sacrificing radiation protection. The goal they give manufacturers calls for a focal spot diameter of one millimeter or less. They feel the duty cycle should be 100% with a radiation output of at least five ma.

Northwest Airlines has been using X-Ray for aircraft inspection since 1955, employs it as a matter of routine during overhaul and for specific inspections on occasion at line stations.

NWA owns two General Electric (Model OX-175 and OX-250) units, figures its costs at $3.00 per exposure. For inner wing structural checks, NWA's director of maintenance Robert L. Rhodes estimates X-Ray saves about 30 manhours alone which otherwise would be required for removal of lining and sealout for visual inspection.

Another big saving results from its use for oil cooler checks. Northwest now X-Rays all premature engine oil coolers for contamination with metal particles. If X-Ray shows no metal, some 40 manhours are saved by elimination of the need to disassemble the unit. Before X-Ray, all coolers were disassembled.

Rhodes feels the big area of improvement should come in the development of lighter and more compact units, designs that will increase the adaptability of X-Ray to inspection, reduce operator fatigue and cut down on manhours necessary to set up the equipment.

EQUIPMENT WORLD

This month, AIRLIFT is featuring runway vacuum sweepers as the major equipment item.

Runway litter, always a nuisance, has created a major maintenance problem in jet operations. To reduce the foreign-object hazard, manufacturers have taken a tip from the housewives and built self-propelled vacuum cleaners capable of picking up bolts, washers, sand and gravel, rags, and a myriad of other items which might damage a jet engine. These big sweepers vary greatly in both size and cost.

Shown here are some of the foremost sweepers now on the market.

Belotti B/5. Belotti of Italy, can sweep 1.2 million sq ft. per hr.; sweeping swath, 8.2 ft.; runs to 28 mph sweeping, 38 mph free; unit mounted on Fiat 642/N6 chassis, driven by 6 cyl., 4-stroke, 90-hp diesel; vacuum powered by 8-cyl., 180-hp diesel; measures 8′ 2″ x 24′ 7″ x 11′.

Circle No. 158 on Reader Service Card.

Wayne Mfg. Co., Pamona, Calif. sweeps 1 million sq. ft. per hr.; sweep-swath, 7.5′; travels 25 mph sweeping, 55 mph on route; mounted on 2½-ton L8-D600 Dodge truck chassis; auxiliary power from Model 56A Chrysler engine, rated at 140-hp.; measures 9′ x 25′ x 10.5′.

Circle No. 159 on Reader Service Card.

Sabre Metal Products Co., Lyons, Ill.; sweeps 2 million sq. ft. per hr.; sweeping swath, 12 ft.; goes 32 mph sweeping; mounted on Ford C-900 chassis; vacuum powered by 385 Hall-Scott gasoline engine; draws 65,000 cu. ft. per min.; measures 8.5′ x 33′ x 12 1/3′; priced at $47,500.

Circle No. 160 on Reader Service Card.

Consolidated Diesel Electric Corp., Stamford, Conn. Model 2095. Sweeps 1 million sq. ft. per hr.; 8 ft. swath; travels 25 mph sweeping, 35 mph en route; mounted on modified truck chassis with 155-hp Ford engine and 255-hp fan engine; measures 8′ x 30.5′ x 11′; price $28,500.

Circle No. 161 on Reader Service Card.

Bulova Altimeter

Bulova Watch Co., Woodside, N.Y. has displayed its new strip-display altimeter. Readings are shown on a strip of logarithmic tape 40 ft. long, graduated from minus 1,000 to plus 65,000 ft., driven past the viewing window by a servo motor. Sensing elements are Melchior aneroid capsules. The electrical indicating mechanism eliminates friction of mechanical systems. Static error is less than 50 ft. at 40,000 ft., and under 20 ft. at 12,000 ft. At sea level, raising or lowering the altimeter as little as two ft. will produce visible tape fluctuations. Unit is 3¼ in. square and 8½ in. long.

Circle No. 170 on Reader Service Card.

Jet Fuel Heater

Garrett Corp's. AiResearch Mfg. Div., Los Angeles, has developed a lightweight fuel heater for jet aircraft. The unit offers protection against fuel icing when used with ground water separation equipment, using compressor bleed air in an air-to-liquid heat exchanger to raise fuel temperatures. The heater is of cross parallel flow design, with both hot air and cold fuel entering the same end of the heat exchanger. Bleed air requirements are no more than ½% at min. fuel temp. and maximum fuel flow specified.

Circle No. 171 on Reader Service Card.

Cargo Hoist Motor

Western Design, division of U.S. Industries, Inc., Santa Barbara, Calif. has announced production of an ac motor for flyaway cargo hoists. The motor, called Model 693, meets MIL-M-7969B, and is reversible with quick-stop magnetic brake and torque limiting clutch. Nominal force delivered at drive shaft is 5 in.-lbs. at 7,200 rpm. Starting torque is said to be better than 10 in.-lbs. Duty cycle is 3 min. "on", 10 min. "off". Works on 200 v, 400 cps. Unit weight is 7.5 lbs.

Circle No. 172 on Reader Service Card.

Jet Parts Cleaner

Pennsalt Chemicals Corp., Philadelphia, has made a preparation for cleaning and de-scaling hot-section jet engine parts. It is a liquid alkaline solution called Delchem 2128A. Parts are soaked in a hot bath of the solution, treated in another bath, and rinsed. All carbon-based soils are lifted off without damage to tolerances or materials.

Circle No. 173 on Reader Service Card.

Doppler VOR

A Compatible Doppler VOR system, developed and marketed by Servo Corp. of America, Hyde Park, L.I., N.Y. is said to make great reductions in site errors created by natural obstructions, such as hangars, trees, etc. Servo Corp. tests have shown the system to reduce course scalloping from 6 to 1 to 20 to 1, thus allowing air lane widths to be reduced.

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Anywhere
in the World
is an Airfield...

FOR THE 16 PASSENGER

Twin Pioneer

Now fitted with higher-powered Alvis Leonides or Pratt & Whitney R. 1340 engines.

Anywhere, that is, where there's a 100 yards or so of anything like level ground, the Twin Pioneer lands comfortably on that, and takes off from even less. Simply, cheaply — almost sedately — the Twin Pioneer is opening up some of the most difficult territories in the World.

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SCOTLAND

Telephone: Prestwick 79888.

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For *Confirmed* Reservations in this area

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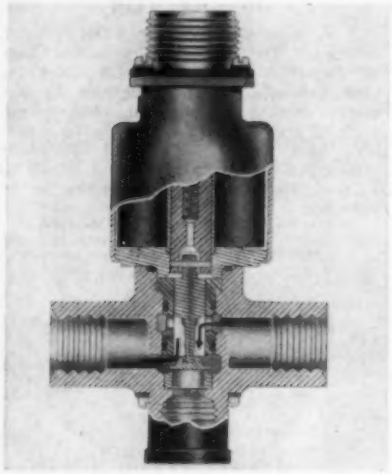
System requires no modification of existing airborne receivers.

Circle No. 150 on Reader Service Card.



Solenoid Valve

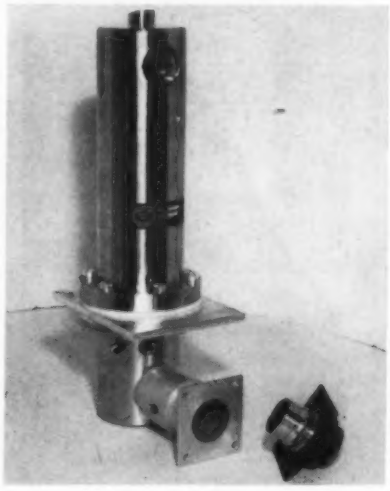
Aero Supply and Mfg. Co., Inc., Corry, Pa., is making a three-way, two-position solenoid valve with short response time which can be used to provide pilot control for larger valves. Solenoid requires 1 amp max. to operate at 14 to 30 v dc for pressures to 1,000 psi. It will handle fuels, oil, air, or other gases. Temperature range is minus 65F to 350F, pressure drop 0.12 psi at 200 lb./hr. 3/8" valve weighs 0.89 lb.

Circle No. 151 on Reader Service Card.

Navigation Indicator

A new BDH Indicator which provides two relative bearings, and distance and magnetic heading on a single face, is being offered by John Oster Mfg. Co., Avionic Div., Racine, Wis. Designated Type 9813-02, it is designed for TACAN, VOR, and other navigational systems. When used with an Oster Coupler, the BDH replaces ID-307 indicator, ID 310 indicator, and compass in a TACAN system.

Circle No. 152 on Reader Service Card.



Jet Analyzer

The Vought Co., Beverly Hills, Calif., in conjunction with General Electric, has built a device for recording burner operation and flame characteristics of jet engines while in flight. The unit is in-

WCA

West Coast sets new passenger records with F-27!

Since the F-27 Prop-Jet was introduced six months ago:

- **The average passenger load is up 48% on flights where F-27's replaced DC-3's.**
- **System-wide there is an increase in passengers per mile of 19.81%.**
- **Total passengers carried has risen 14.62%.**
- **The average distance per passenger increased from 180 miles to 194.**
- **The volume of interline exchange broke all records for a six-month period.**

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Serving 42 cities in Washington, Oregon and Idaho; soon to serve 21 more in California, Utah and Montana.

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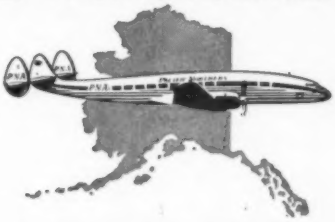

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See your local travel agency or write to Promotion Dept. for Brochure 390

BOSTON Hancock 6-6625 MIAMI Franklin 9-8331 CHICAGO Dearborn 2-

Circle No. 62 on Reader Service Card.

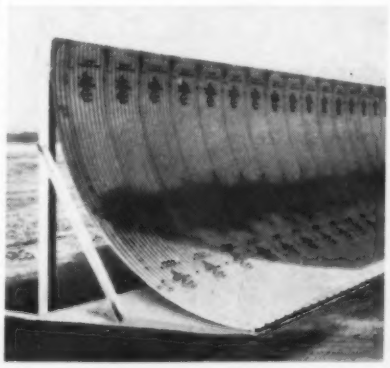
stalled in the exhaust stream, and makes a color recording of the burning process. Another version of the device permits visual observation or photography possible at distances up to 14 ft. in ground test facilities.

Circle No. 153 on Reader Service Card.

Battery Cable

Truck Equipment Distributors, Inc., Denver, has made a plastic battery cable said to be impervious to acids, oil, and gas, with 200 ohms less resistance than any other cable. The cable has a nylon connector nut and sodium hydroxide impregnated felt washer which neutralizes sulphuric acid. One style cable fits positive or negative terminals on six or 12 v batteries.

Circle No. 154 on Reader Service Card.



Jet Blast Fence

USAF has ordered over 65,000 ft. of the new Vinnell-Lynnco blast fence for installation at U.S. and overseas air bases.

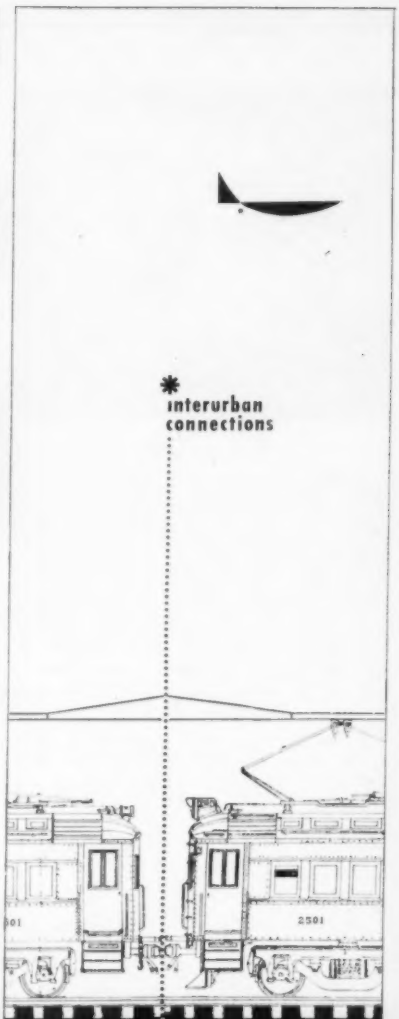
The Vinnell-Lynnco fence has no baffles or vane-type deflectors. It is a single curved deflector which converts the high-velocity boundary layer of the blast into a vertical "air wall." This wall directs the stream upward, thus providing quick dissipation.

Circle No. 155 on Reader Service Card.

Automatic Announcer

Westrex, a division of Litton Industries, Los Angeles, has developed an automatic announcing device which can give voice announcements, in any language, about arriving or departing airline flights. When a flight is to be announced, the operator punches the flight number on a keyboard to get the desired message or message component.

Circle No. 156 on Reader Service Card.



have a NEW MEANING!

Late in the nineteenth century, commuters in the Great Lakes Area relied on the interurban to take them from city to city, and to make connections at the nation's large railway terminals.

Today's interurbanite FLIES . . . he flies Lake Central Airlines, the local service airline operating in the six states of Indiana, Ohio, Illinois, Michigan, New York and Pennsylvania. Lake Central connects 31 cities, including Buffalo, Chicago, Cleveland, Indianapolis, Pittsburgh, Cincinnati and Grand Rapids.

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Call your local Lake Central office, travel agent or any airline for reservations

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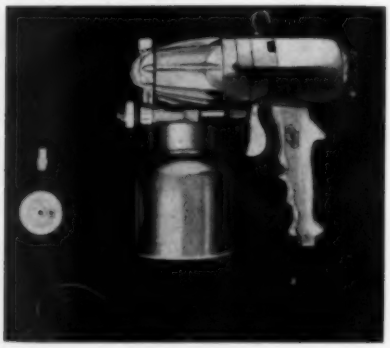


Spray Gun

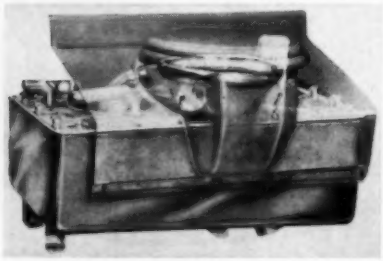
A new spray gun and new gearing for older models is being offered by Sellco Corp., St. Paul. The new gear is a bevel driven by a nylon bevel pinion, and is said to give five times the life of normal gears. Older units can be converted at factory for $14.50. The new gun includes an extra can, three nozzles, respirator, oil, filters, wrench, case, and instructions. Unit weighs 14 lbs. and costs $59.95.

Circle No. 165 on Reader Service Card.

Vacuum Pump

Airwork Corp., Millville, N.J., is making a vacuum pump designed for light aircraft with vacuum instrumentation. The pump discharges completely oil-free air, eliminating the need for oil separators, connecting lines, and nacelle drains. It is rated at 4.5 cfm, with four in. Hg suction, one in. pressure, turning 3,000 to 3,750 rpm.

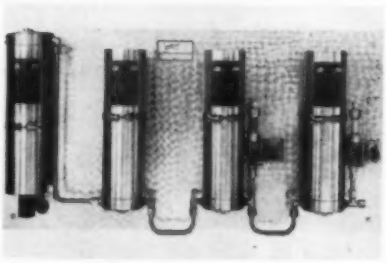
Circle No. 164 on Reader Service Card.



Flushable Toilet

A flushable, automatic water closet, the "AIR-LAV," has been introduced by Koehler Aircraft Products Co., Dayton, O. It is designed for all types of civil and military transports. The "AIR-LAV" is self-contained, and will operate for approximately eight hours, or about 100 uses, without attention. It is made of stainless steel, with plastic seat and shroud. Automatic flushing is controlled by button. All cleaning and filling operations are handled from outside the airplane.

Circle No. 166 on Reader Service Card.



Dehydration System

Robbins Aviation, Los Angeles, has designed a dehydration system with disposable cartridges. System is applicable to ground support pneumatic systems on many aircraft and missile types which call for dry oil free gas. Pressure range is 600 to 12,000 psi with flow rates to 550 scfm. Dewpoint and oil vapor content of less than ½ part per million can be obtained. Designed for air, nitrogen, or helium, the units use "O"-rings throughout and require no tools for cartridge change.

Circle No. 167 on Reader Service Card.

Power Inverter

A solid-state static power inverter, with transistor and magnetic amplifier circuitry to convert 26-30 v. dc source to 115 v., 400 cps, single phase ac source, has been developed by Magnetic Amplifiers, Inc., N.Y.

The unit was designed for use in aircraft and ground equipment, missiles, and jet aircraft ignition systems.

Inverter is said to have a life expectancy of 20,000 hrs. under continuous operation, compared to the 2,000 hrs. of conventional apparatus. It has no moving parts, no bearings and contains no vacuum tubes.

Power inverter can withstand vibrations of 10 to 2,000 cycles, and can absorb shock up to 30 times its weight. It will not spark at any altitude. Built to MIL-E-5400 and MIL-E-5272, the 250 v-unit has an output of 115 v., adjustable to plus or minus 5%, output frequency of 400 cps, plus or minus 1%, and power factor from minus 0.5 to plus 0.5.

Circle No. 168 on Reader Service Card.

Sonic Altimeter

A sonic altimeter, designed primarily for all-weather helicopter navigation, is being produced by Bendix-Pacific Division of Bendix Aviation, N. Hollywood, Calif.

Altitude information, said to be accurate to within 6 in., is presented on a standard dial instrument. The indicator gives absolute altitude readings above actual ground level.

To determine altitude, the sonic altimeter uses the echo-ranging principle, measuring echo-return time of sound energy with vernier-type fine accuracy. The length of the sound pulses automatically decrease with decreasing altitude and the pulse rate automatically increase, for greater accuracy.

Total weight of the equipment is 12.5 lbs., and it operates on standard 115 v., 400 cycle single-phase power.

Circle No. 169 on Reader Service Card.

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with TECO's new, free Engineering Bulletin Service on aircraft seating. Latest styling, full-color view, dimensions and specifications are on every sheet—sent in sturdy binder cover.

WRITE now for this valuable personal or Engineering Library reference and automatically receive additional new inserts as each is produced!

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Circle No. 65 on Reader Service Card.

INFO FOR THE ASKING

Fluorescent markings—color sheet from Radiant Color Co., Oakland, Calif. describes its line of high-visibility markings and how the colors can be used to improve in-flight safety.

Fire extinguishers—American LaFrance, Elmira, N.Y., has new brochure about portable fire extinguishers for plant and office use. Describes carbon dioxide, dry chemical, soda-acid, foam, and other major fire fighting units.

Facilities—Chandler Evans Corp., West Hartford, Conn. is offering a 16-page color brochure describing its industrial facilities for manufacturing, engineering, and service of its engine control equipment.

Flight control—Collins Radio, Cedar Rapids, Iowa, has a bulletin about the Collins AP-103 Automatic Flight Control System which provides complete three-axis control for high performance aircraft.

Hydraulic valves—Single sheet from General Controls Co., Glendale, Calif. shows drawings of six types of hydraulic valves in class A (0 to 4 gpm), class B (4 to 12 gpm), and class C (12 to 25 gpm).

ASDE radar—Airborne Instruments Lab., Garden City, L.I., N.Y., has published a booklet discussing the air traffic control problems which led to the development of ground radar. Shows typical airport maps and radar representations, and describes the component equipment required at an installation.

Pumps and motors—Pesco, Bedford, O., a division of Borg-Warner, has a four-page color brochure listing its line of high temperature hydraulic pumps and motors.

DC motor—Hoover Electric Co., Columbus, Ohio, specification sheet shows drawing and complete details of its Model D-1,000 1.6 hp, 28v dc motor.

Air/ground communications — 10-page color brochure from Defense Electronic Products, Camden, N.J., division of Radio Corp of America, describes AGACS system of automatic air traffic communications design to speed traffic control.

FAA Aeronautical Center — Bulletin from FAA describes its new Oklahoma City Aeronautical Center, and the work performed there.

Aircraft positioning—Booklet outlining the Bolton aircraft positioning and locating system has been issued by Space Corp., Dallas, Tex. Shows method of handling aircraft at the ramp and moving them to and from the landing area.

"O" rings—A 20-page booklet about the design and application of "O" rings has been published by The Garlock Packing Co., Palmyra, N.Y. Covered are materials of construction, dynamic and static applications, use of back-up or non-extrusion rings, and groove design.

Thermostats—Vap-Air Aeronautical Products Division of Vapor Heating Corp. is offering a 4-page bulletin on liquid temperature and sensing thermostats. Typical circuits, response curves, and contact tolerances of these mercury thermostats are shown.

Fuel resistance—Thiokol Chemical Corp. has issued a report comparing effects of high aromatic fuels on oil-resistant elastomers. Data shown indicates that the trend to higher aromatic hydrocarbon fuels is a significant factor in compounding rubber good to get required fuel resistance.

Nozzles—32-page catalog from Industrial Division of Wm. Steinen Mfg. Co., Newark, N. J. lists all types of nozzles for industrial spray applications. Specific data on spray angles, dimensions, types of connections, and capacity vs. pressure for all standard nozzles is included.

Industrial TV cameras—4-page brochure tells about a complete line of industrial television cameras offered by KEN TEL Division of Cohu Electronics, San Diego. Cameras can operate in 145-db noise environment without danger of microphonics affecting picture. Bulletin describes heavy-duty characteristics that make these cameras suitable for use in conjunction with other machinery.

Books and equipment—45-page catalog published by Pan American Navigation Service, Inc., North Hollywood, Calif. lists a complete array of available books and equipment on all phases of aviation.

Molded rubber—45-page technical handbook about the properties, uses, and processing methods involved in working with rubber. From Stowe-Woodward, Inc., Newton Upper Falls, Mass.

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FOR SALE

DC-4 AIRCRAFT INTERIOR

70 Payloader seats, model A22FT, folding hat racks, galley with coffee urns, oven, and storage space plus working area and brown Durag plasticised floor covering with vinyl sponge rubber backing.

2 R2000-7M2 P&W ENGINES NTSO by Airwork—for sale or exchange for R2000-D5 engines.

DC-4 parts and accessories and C-46 parts for sale.

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C-46F AIRCRAFT
Passenger and Cargo
With or Without
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Immediate Delivery
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1200 AMP GROUND STARTING UNIT

1200 amps at 28.5 DC Volts
8KVA—1 phase—400 cyl. AC
Mounted on three wheel dolly.
Replacement spares in stock.
Condition Excellent $1500.00
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Write for additional information, pictures and specifications.

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4101 hours current time, excellent references. SMEL, Instrument. 6 years executive pilot and co-pilot experience. Single, Age 36, B. A. degree. **Randy Robertson,** Route 8, Box 405, Tulsa 7, Oklahoma, Filmore 5-9775, Filmore 5-4194.

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Help Wanted

Ground School instructor is needed by *Allegheny Airlines, Inc.* to work in Washington. Applicants must be able to teach on all equipment and ground school, and able to operate the Link, and maintain records & manuals. *Write Personnel Office,* Hangar 12, W & A, Washington, D.C.

Auxiliary power unit—General Electric has an 8-page publication which describes the feature and characteristics of its 40-hp turbodrive that is designed to give both electric and hydraulic power for high-speed, high-altitude, long-mission applications.

Low Approach Simulator—"Decision," a 12-page brochure, describes operation of Dalto low-weather approach, landing and take-off simulator for attachment to electronic flight simulators. Includes economics of unit's operation. Dalto Corp., Jamaica, N.Y.

Go-no-go—Magnetic Circuit Elements, Inc., Montrose, Calif. has published a bulletin describing a go-no-go frequency sensor which includes features, drawings, and specifications.

Hose Clamps—Four-page brochure from Wittek Mfg. Co., Chicago, describes a complete line of stainless steel clamps for aviation hose and duct connections. Included are charts for single and multiple sizes, with and without shoe.

Automatic door—Mosher Mfg. Co., Minneapolis, has a brochure about its automatic hangar door opener. Device enables pilots to open or close hangar door from inside airplane.

Engine silencing—International Aerocoustics Div. of Industrial Acoustics Co., New York, has two bulletins describing its line of noise suppressors and typical installations. Included is data on cost, portability, obtainable attenuation, etc.

Jet engine analyzer—B&H Instrument Co., Ft. Worth, has published a group of brochures about jet analyzers, temperature measuring equipment, and frequency testers it makes. Contains specifications, descriptions, and special features.

Servo systems—Kearfott Co., Inc., Little Falls, N.J., is giving a 48-page booklet about servo motors, motor generators, and synchros. Schematics, curves, tables, and formulas cover wide range of applications.

FOR THE BOOKSHELF

• Write Flight Safety Foundation, 468 Fourth Ave., New York 16, N.Y. for booklet, "27 Ways to Cut Engine Overhaul Costs." Price 25¢.

EXECUTIVE BEECHCRAFT FOR SALE

D18S, 1946 model by pilot owner. 1,000 hr. inspection recently completed. New tires, wheels, brakes, flaps. TT 3,000 hrs., engines 575 TSO. Equip. includes 2 ARC 15 Omnis; 2 localizers; 6 channel glide slope; T11 standy transmitter and receiver; ARC 1 transmitter and receiver; ARC 5 LF receiver; Bendix ARN 7 ADF; autopilot & Coupler; rotating beacon; hydromatic props and full deicing. Write or call

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Wayne W. Parrish

Two Haircuts in Russia

Jet Flight to Siberia . . . A Stop at Sverdlovsk

Photos by Wayne W. Parrish

Mr. and Mrs. WWP with Intourist guides in front of fishing village collective headquarters on Lake Baikal in Siberia. Car is Russian, similar to old U.S. Buick.

Because of bad weather at Omsk, our TU-104A jet flight from Moscow to Siberia stopped for refueling at Sverdlovsk, an industrial city about a third of the way to Irkutsk. It was late at night and all I could see from my window were the lights of a large city.

Before we disembarked one of the stewardesses announced that we would stay overnight here because of bad weather at Irkutsk. Such a delay was okay by me. I figured I would get more glimpses of Russia than were scheduled.

But inside the terminal we were directed to proceed to an alleged hotel a couple of hundred feet away, instead of going into town. So along with sixty-odd Russians, Chinese and Mongols, my wife and I and our interpreter, Raya Smirnova, skirted mud and water in the unlighted walk. The small hotel lobby was already jammed and I had visions of sleeping barracks style. There was a lot of confusion and talking.

After about 15 minutes of waiting outside, the word came out (and interpreted for us by Raya) that it was all a mistake. Our jet would be proceeding to Irkutsk in about an hour. (Next time you get messed up at an airport, remember it happens also in the Soviet Union).

We waited almost two hours. The terminal itself had three large halls which resembled lounge rooms. A few maps were on the walls, and there was plenty of reading material in Russian. A restaurant was at one end. There must have been 50 to 75 people, mostly men, sleeping in chairs or on sofas or just sitting drearily waiting for a flight to somewhere.

When the local Intourist representative (there's one at all times at every transportation terminal) discovered that we were foreigners, she went to extraordinary lengths to offer us hospitality, food and drinks. (Americans rarely get to Sverdlovsk). This was another of many examples of how Russians go out of their way to give warm welcomes to foreigners.

Once we got back on the jet, it was a four-and-a-half hour flight to Irkutsk, stretching the TU-104A range just about to the ultimate limit. We got a little sleep, the flight was very smooth, but I was awake at the crack of dawn to see what I could of the Siberian landscape. As we went into a long descent I could see the rolling countryside dotted with small towns, most of them with factories. There has been a major expansion of population and industry in the general area west of Irkutsk.

The weather was good. It was hard to believe it had been bad only a few hours earlier. There are ample indications that communications in the U.S.S.R. are both inefficient and slow for most purposes.

It was almost full daylight when we rolled to a stop on the long main runway at Irkutsk and taxied to the old terminal. On the apron were perhaps eight to twelve TU-104 jet types, plus quite a few piston IL-14s, including some belonging to the Red Chinese airline and Air Mongol, the Mongolian airline, which I hadn't known existed. Irkutsk is a major junction point. Our jet was to go on east to Ulan Bator, Outer Mongolia, and to Peking, capital of Red China.

Our arrival apparently took the local Intourist office by surprise. No arrangements had been made for car or itinerary, so we were taken to the Intourist office in the airport. After cleaning up we had breakfast (excellent omelette) in a small dining room reserved for transients, and to show what a small world this can be, who should be having breakfast also but Howard Sochurek, the well-known *Life* photographer who was on his way back to Moscow from a photographic assignment in Yakutsk, nine hours' flying north into upper Siberia.

In due course our local car and guide arrived and we were taken to the leading hotel of Irkutsk, a three-story affair unlike anything I had ever seen before.

Since we were travelling deluxe with Intourist, my wife and I were each given small suites because each suite had only a single bed. My layout virtually defies description.

At the room door were brilliant red and blue velvet drapes. Just beyond, between the anteroom and the living room, were more velvet drapes. And between the living and bed rooms were still more. There was a big, fancy lampshade of silk. Lots of fine cut glass, old-fashioned in style, was everywhere. There was a big, heavy desk with very elaborate ink stand. A large clothes cabinet was equipped with pants holders and clothes brushes. There were four straight chairs with velvet covers and backs, and one large lounge chair. I had a dining table for myself, covered with lace. And on one wall was a big clock which struck the chimes every half hour—and it didn't miss day or night.

In the small bedroom was a single bed with fancy covers, and a dressing table with mirror. But the bathroom was something to behold. It was very small. On one wall was a tiny wash basin, and considerably above it was one water tap (cold water only). And no mirror for shaving. And no soap, as I recall. Opposite was the water closet without a seat, a reminder that we were far to the east where many people are unable to perform their body functions higher than from a squatting position through centuries of custom. (A high percentage of the world's population is in that category). There was no toilet paper of any kind, and the water pressure wasn't strong enough to flush the toilet properly. But thus be it—I had made it by jet to the heart of Siberia.

Russian girls in fishing village at lower end of Lake Baikal in Siberia, not far from Irkutsk, deep in the interior of Siberia and a major junction point.

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Aircraft Data Cards

Aircraft selected for the Data Card series in this issue are the Lockheed JetStar, Canadair Model 540, and the Boeing 377 Stratocruiser.

The JetStar is the first light jet transport on the market, and Lockheed is offering both civil and military versions. Pictured is the twin-engine corporate model, which features additional baggage space and reverse thrust.

The Canadair 540 is essentially the Model 440 Convair with the addition of turboprop engines. First airplanes are now undergoing flight tests and demonstrations here and in Canada.

The Stratocruiser is the airplane that established Boeing as a transport manufacturer. Famed in the KC-97 aerial tanker version, the 377 is now in service with Pan American, BOAC, and Northwest Airlines.

LOCKHEED JETSTAR

(twin-engine corporate version shown)

Aircraft Data Card
May, 1959

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CANADAIR MODEL 540

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BOEING 377 STRATOCRUISER

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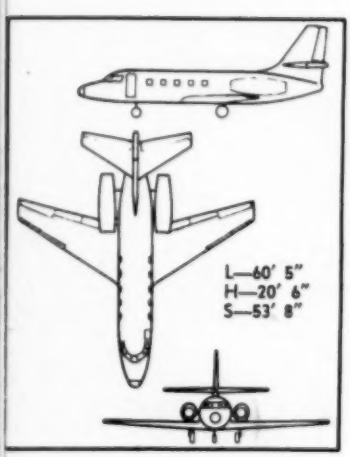

LOCKHEED JETSTAR
(4 engine version)

TYPE: 8-passenger, four-engine jet utility transport. WEIGHTS: empty—17,551 lbs. normal gross—31,630 lbs. max. gross—38,930 lbs. POWERPLANTS: (4) Pratt & Whitney JT 12 turbojets rated at 3,000 hp. PERFORMANCE: max. speed—540 mph (cruise) range—2,610 m. landing field lengths—5,600 ft. without reverse thrust, 4,995 ft. with reverse thrust. MFG.: Lockheed Aircraft Corp., Marietta, Ga.

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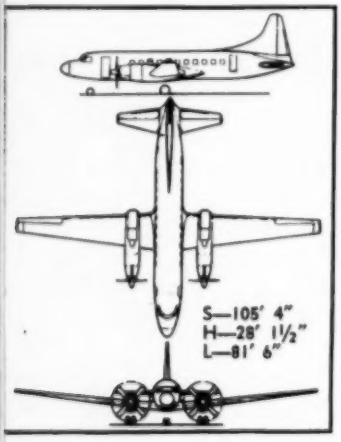

CANADAIR MODEL 540

TYPE: 48/58 passenger turboprop transport. WEIGHTS: empty—47,000 lbs. gross—53,200 lbs. POWERPLANTS: (2) Napier-Eland 6 engines, rated at 3,500 ehp. PERFORMANCE: cruise speed—315 mph (20,000 ft.) range—900 m. (48 pass.) 780 m. (58 pass.) MFG.: Canadair, Ltd., Montreal.

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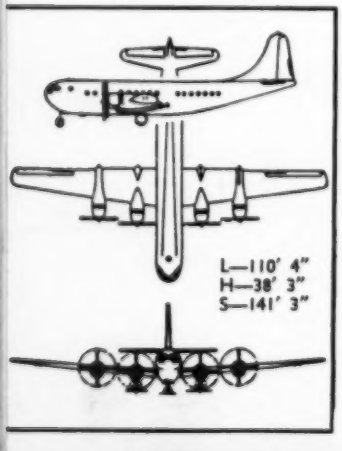

BOEING 377 STRATOCRUISER

TYPE: 4-engine, 86 passenger transport. WEIGHTS: empty—83,500 lbs.; gross—142,000 lbs. POWERPLANTS: (4) Pratt & Whitney R 4360-TSB3-G engines. PERFORMANCE: max. speed—375 mph; cruise speed—296 mph; normal range—1,500 mi. MFR.: Boeing Airplane Co., Seattle, Wash.

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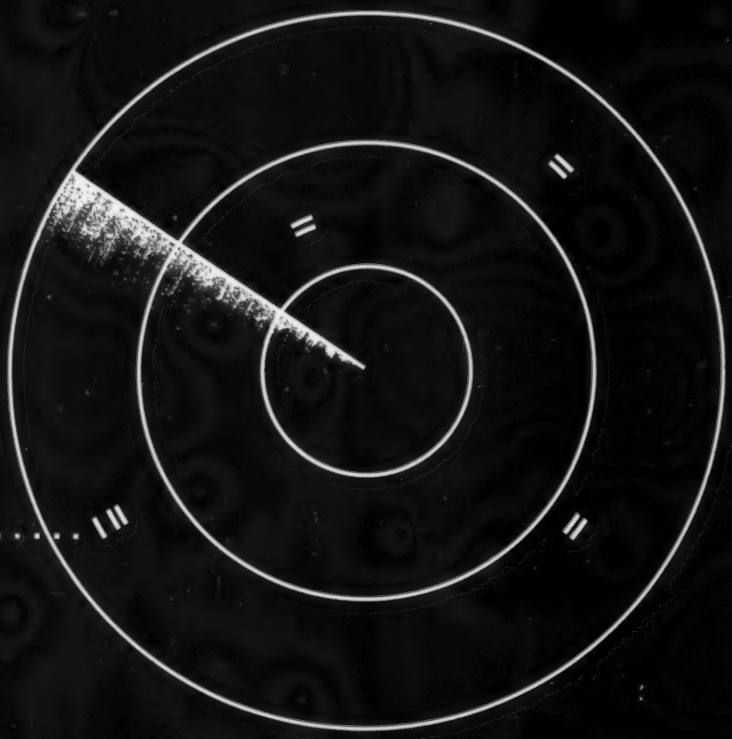

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